SOIL SURVEY OF

Pickens County, South Carolina

United States Department of Agriculture
Soil Conservation Service
In cooperation with
South Carolina Agricultural Experiment Station

Issued June 1972

Major fieldwork for this soil survey was done in the period 1954–66. Soil names and descriptions were approved in 1967. Unless otherwise indicated, statements in this publication refer to conditions in the county in 1966. This survey was made by the Soil Conservation Service in cooperation with the South Carolina Agricultural Experiment Station. It is part of the technical assistance furnished to the Pickens Soil Conservation District.

Either enlarged or reduced copies of the soil map in this publication can be made by commercial photographers, or they can be purchased on individual order from the Cartographic Division, Soil Conservation Service, U.S. Department of Agriculture, Washington, D.C. 20250.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of Pickens County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the county in alphabetic order by map symbol and gives the capability classification of each. It also shows the page where each soil is described and the page for the capability unit and the woodland suitability group in which the soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay on the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of the capability units and woodland suitability groups.

Foresters and others can refer to the section "Use of the Soils for Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Use of the Soils for Wildlife Habitat."

Engineers and builders can find, under "Engineering Uses of the Soils," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Community planners and others can read about soil properties that affect the choice of sites for nonindustrial buildings and for recreation areas in the section "Use of the Soils for Town and Country Planning."

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of the Soils."

Newcomers in Pickens County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the information about the county given in the section "Additional Facts About the County."

Cover: Soil, water, recreation, and timber—four resources of Pickens County. The soil in the background is Saluda sandy loam, 10 to 25 percent slopes.

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SOIL SURVEY OF PICKENS COUNTY, SOUTH CAROLINA

BY HUGER S. BYRD, SOIL CONSERVATION SERVICE

FIELDWORK BY HUGER S. BYRD, R. W. CRAFT, AND W. H. FLEMING, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE SOUTH CAROLINA AGRICULTURAL EXPERIMENT STATION

PICKENS COUNTY is in the northwestern part of South Carolina (fig. 1). It is separated from Oconee County on the west by the Toxaway and Keowee Rivers and by Hartwell Reservoir on the southwest. Anderson County is the southern boundary, extending roughly in a southwest-northeast direction. Greenville County is on the east and northeast, separated from Pickens by the South Saluda and Saluda Rivers. Pickens County is bounded on the north by Transylvania County, North Carolina. The total extent of the county is 324,986 acres, or about 508 square miles.

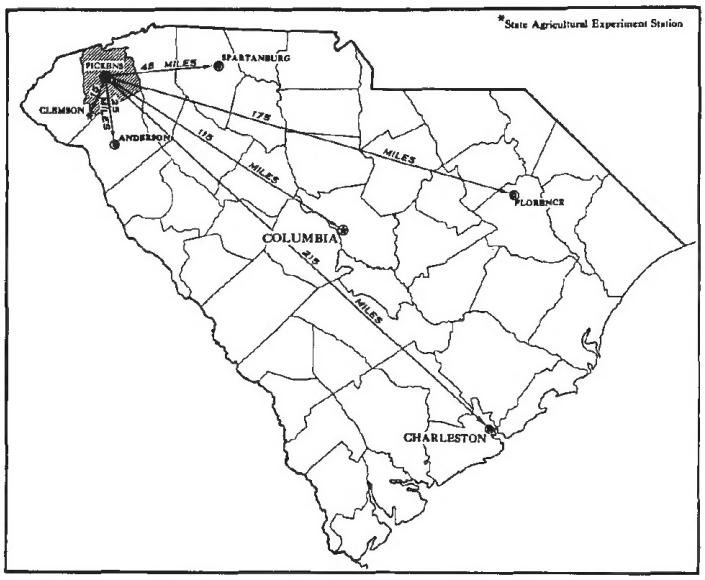

Figure 1.—Location of Pickens County in South Carolina.

Pickens, the county seat, is in the central part of the county. It has an elevation of about 1,100 feet.

The northwestern 14 percent of Pickens County is in the Blue Ridge Mountains. The elevation ranges from 1,400 to 3,554 feet but averages about 1,900 feet. The remaining 86 percent is in the Piedmont Plateau. The elevation ranges from about 700 to 1,400 feet.

In 1964 livestock and livestock products accounted for about 65 percent of farm income. Forest products and horticultural specialty products accounted for about 18 percent; field crops, about 11 percent; and all other sources, about 6 percent.

How This Soil Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in Pickens County, where they are located, and how they can be used. The soil scientists went into the county knowing they likely would find many soils they had already seen, and perhaps some they had not. They observed the steepness, length, and shape of slopes; the size and speed of streams; the kinds of native plants or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The soil series (*12*) [1] and the soil phase are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Cecil and Grover, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface layer and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Cecil sandy loam, 2 to 6 percent slopes, eroded, is one of several phases within the Cecil series.

[1] Italic numbers in parentheses refer to Literature Cited, page 69.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

In most areas surveyed there are places where the soil material is so rocky, so shallow, or so severely eroded that it cannot be classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names. Rock land is a land type in Pickens County.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soil in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in such a way as to be readily useful to different groups of users, among them farmers, managers of woodland, and engineers.

On the basis of yield and practice tables and other data, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others; then they adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under current methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Pickens County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field, or for selecting the exact location of a road, building, or similar structure, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The six soil associations in Pickens County are discussed in the following pages.

1. *Edneyville-Porters-Hayesville association*

Well-drained, strongly sloping to very steep soils that have a loamy subsoil and are moderately deep or deep to weathered rock; on mountains

This association is in the northwestern part of the county. It makes up about 4 percent of the county. About 33 percent of the association is made up of Edneyville soils; 23 percent, of Porters soils; 12 percent, of Hayesville soils; and the rest, of less extensive soils. These soils formed in material weathered from granite and gneiss in a cool climate characterized by abundant rainfall. The slope ranges from 10 to 80 percent.

Edneyville soils have a surface layer of very dark grayish-brown and yellowish-brown fine sandy loam and a subsoil of yellowish-brown, friable sandy clay loam. Porters soils have a surface layer of black loam and a subsoil of dark-brown and yellowish-brown clay loam. Hayesville soils have a surface layer of dark grayish-brown and dark yellowish-brown fine sandy loam and a subsoil of yellowish-red and red, friable sandy clay loam and clay loam.

Stony land and soils of the Saluda, Ashe, and Tusquitee series make up the rest of this association. Stony land is steep and occurs on narrow ridgetops. Saluda soils are generally steep and are adjacent to Edneyville soils. Most areas of Ashe soils occur in rough mountainous areas adjoining Saluda and Edneyville soils and Stony land. They are very steep. Tusquitee soils are in draws and on basal slopes.

This association is suited to the production of timber. It has severe limitations for dwellings where septic tanks are needed, for industrial sites, and for campsites or intensive play areas. Some of the few streams in the State suitable for trout fishing are in this association. Some sites are suitable for wildlife plantings, but generally the slope makes hunting difficult.

2. *Ashe-Saluda-Stony land association*

Excessively drained to well-drained, strongly sloping to very steep soils that have a loamy subsoil and are moderately deep or shallow to weathered rock; on mountains.

This association is mostly in the northern part of the county. It extends in an east-west direction as a long, relatively narrow strip. This association makes up about 10 percent of the county. About 31 percent of the association is made up of Ashe soils; 30 percent, of Saluda soils; 18 percent, of Stony land; and the rest, of less extensive soils. Some areas are stony. The soils formed mainly in material weathered from granite and from gneiss that has a high content of quartz. The slope ranges from 10 to 90 percent but is chiefly about 60 percent.

Ashe soils have a surface layer of very dark grayish-brown and brown sandy loam underlain by yellowish-brown, very friable sandy loam. Below this is weathered rock. Saluda soils have a surface layer of very dark

grayish-brown and brown sandy loam and a subsoil of strong-brown, friable sandy clay loam. Weathered rock occurs at a depth of 20 inches or less. Stony land, a miscellaneous land type, consists of areas where stones cover 3 to 15 percent of the surface.

Rock land and soils of the Rabun, Edneyville, Porters, Clifton, and Tusquitee series are the less extensive soils in this association. Most of these soils occur as irregularly shaped areas. The Rabun and Clifton soils are on narrow ridgetops and steep side slopes. Edneyville soils are generally on the smoother southern slopes, and Porters soils are on the northern slopes. Tusquitee soils are in draws and on basal slopes. Rock land is a miscellaneous land type. It consists of very shallow soils and rock outcrops.

This association is a valuable source of water supply for municipal uses and for generation of electricity. All of the association is in woodland. At the highest elevations there are plants, birds, and animals seldom found in other parts of the State.

The association has severe limitations for dwellings where septic tanks are needed, for industrial sites, and for campsites or intensive play areas. In places, many large granite boulders are on the surface.

3. *Pacolet-Grover-Hiwassee association*

Well-drained, moderately steep or steep soils that have a dominantly clayey subsoil and are moderately deep or deep to weathered rock; on uplands

This association occurs as a wide strip in a southwest-northeast direction across the north-central part of the county. It adjoins the mountainous area. It makes up about 45 percent of the county. About 66 percent of the association is made up of Pacolet soils; 13 percent, of Grover soils; 11 percent, of Hiwassee soils; and the rest, of less extensive soils. Elevations range from about 700 to 1,400 feet but are mostly 1,100 to 1,400 feet. In most areas the slopes are very long. The slope ranges from 15 to 60 percent but is mainly 25 to 35 percent.

Pacolet soils have a surface layer of brown fine sandy loam. The subsoil is red, firm clay and clay loam but is dominantly clay. Grover soils have a surface layer of light brownish-gray and pale-brown fine sandy loam and a subsoil that is reddish-yellow, friable light sandy clay loam in the upper part and yellow, very friable sandy loam in the lower part. Hiwassee soils have a surface layer of dark reddish-brown sandy loam. The subsoil is dark-red, friable sandy clay loam and firm clay loam in the upper part and dark-red, firm clay and red clay loam in the lower part.

Soils of the Gwinnett, Tallapoosa, Louisburg, Musella, Starr, Worsham, and Cataula series are the less extensive soils in this association. Gwinnett, Tallapoosa, Louisburg, and Musella soils are steep. Starr soils are in depressions. Worsham soils are at the heads of drainageways. Cataula soils are gently sloping.

This association is well suited to woodland, but most areas are too steep for cultivated crops or pasture. Runoff is very rapid, and erosion is a very severe hazard where the soils are cleared for crops or pasture. About 8 percent of the acreage is used for crops, 12 percent for pasture, and 80 percent for woodland.

Because of the slope, this association has severe limitations for dwellings where septic tanks are needed, for industrial sites, and for campsites or intensive play areas.

4. *Cecil-Hiwassee-Madison association*

Well-drained, dominantly sloping soils that have a dominantly clayey subsoil and are moderately deep or deep to weathered rock; on uplands

This association is mainly in the south-central part of the county. It occupies the more gently sloping uplands between the major drainageways. This association makes up 20 percent of the county. About 56 percent of the association is made up of Cecil soils; 31 percent, of Hiwassee soils; 5 percent, of Madison soils; and the rest, of less extensive soils. The slope ranges from 2 to 35 percent but is mainly 6 to 10 percent. Most of the slopes are long. The steeper and shorter slopes are adjacent to streams.

Cecil soils have a surface layer of yellowish-red sandy loam and a subsoil of red, friable to firm clay loam or clay. Hiwassee soils have a surface layer of dark reddish-brown sandy loam and a subsoil of dark-red, firm to friable clay loam or clay. Madison soils have a surface layer of dark grayish-brown to red sandy loam and a subsoil of red, firm to friable, micaceous clay loam or clay.

Pacolet, Grover, Worsham, Starr, Cataula, Helena, and Gwinnett soils are the less extensive soils in this association. Pacolet and Gwinnett soils are moderately steep. Cataula, Grover, and Helena soils are gently sloping. Worsham soils are at the heads of drainageways. Starr soils are in depressions.

Most of this association is well suited to the commonly grown crops. About 45 percent of the acreage is used for crops, 30 percent for pasture, and 25 percent for woodland. Erosion is a moderate hazard, and conservation measures are needed where the soils are used for crops or pasture.

This association is suited to woodland. It has moderate limitations for building sites, reservoirs, or recreational areas and for use as foundation material for roads. It has moderate to severe limitations for septic tank disposal fields. It is suitable for wildlife plantings.

5. *Cecil-Madison-Pacolet association*

Well-drained, strongly sloping to steep soils that have a dominantly clayey subsoil and are moderately deep or deep to weathered rock; on uplands

This association is mainly in the southwestern and southeastern parts of the county. It occupies the hilly terrain adjacent to major drainageways. The association makes up about 15 percent of the county. About 49 percent of the association is made up of Cecil soils; 19 percent, of Madison soils; 12 percent, of Pacolet soils; and the rest, of less extensive soils. The slope ranges from about 10 to 40 percent but is chiefly about 15 percent.

Cecil soils have a surface layer of yellowish-brown sandy loam underlain by red, firm clay loam and clay. Madison soils have a surface layer of yellowish-red sandy loam underlain by red, friable, micaceous clay loam and clay. Pacolet soils have a surface layer of brown sandy loam underlain by red, firm clay loam and clay.

Soils of the Hiwassee, Cataula, Grover, Starr, and Worsham series are the less extensive soils in this association. The Hiwassee, Cataula, and Grover soils occur as small areas among the Cecil, Madison, and Pacolet soils. Starr soils are in depressions. Worsham soils are at the heads of drainageways.

About 20 to 25 percent of this association is severely eroded, and in many places there are large gullies. About 10 percent of the acreage is used for crops, 20 percent for pasture, and 70 percent for woodland. Runoff is very rapid, and erosion is a severe hazard. Where the soils are used for crops or pasture, intensive conservation measures are needed for control of erosion.

This association has severe limitations for dwellings where septic tanks are needed, for industrial sites, and for campsites or intensive play areas. Many sites are suitable for wildlife plantings.

6. *Toccoa-Chewacla association*

Well-drained to somewhat poorly drained, nearly level soils that are dominantly loamy throughout and are subject to flooding; on bottom lands

This association is on first bottoms bordering the larger streams. It makes up about 6 percent of the county. About 45 percent of the association is made up of Toccoa soils; 38 percent, of Chewacla soils; and the rest, of less extensive soils. These soils are deep. The soil material was transported by floodwaters from areas within the watershed and was deposited along stream bottoms throughout the county. The slope ranges from 0 to 3 percent.

Toccoa soils have a surface layer of dark-brown sandy loam underlain by dark-brown and brown, very friable sandy loam thinly stratified with other textures. Chewacla soils have a surface layer of dark-brown loam. The subsoil is dark-brown, friable clay loam and silty clay loam in the upper part and light brownish-gray silty clay loam in the lower part.

Soils of the Buncombe, Helena, Hiwassee, Starr, and Worsham series make up the rest of this association. Buncombe soils are sandy. They occur in areas adjacent to stream channels. Helena soils are on low uplands. Hiwassee soils are sloping. They occur on uplands adjacent to the flood plains. Starr soils are in depressions and on basal slopes. Worsham soils are near the heads of draws.

The well-drained Toccoa soils are suited to corn and pasture crops, but they are subject to occasional flooding. In a few places, flood control structures are effective for limited areas. Chewacla soils are used mainly for fescue and Ladino clover. About 75 percent of the acreage is used for crops or pasture, and 25 percent is in woodland.

This association provides habitat for squirrels and rabbits. It has severe limitations for dwellings where septic tanks are needed, for industrial sites, and for campsites or intensive play areas.

Descriptions of the Soils

This section describes the soil series and mapping units of Pickens County. For full information on any one mapping unit, it is necessary to read the description of the soil series, as well as the description of the mapping unit. The approximate acreage and proportionate extent of the soils are given in table 1.

In the pages that follow, a general description of each soil series is given. Each series description has a short narrative description of a representative profile and a much more detailed description of the same profile, from which highly technical interpretations can be made. Following the profile is a brief statement of the range in characteristics of the soils in the series, as mapped in this county.

Following the series description, each mapping unit in the series is described individually. Color names and color symbols given are for a moist soil, unless otherwise indicated. Miscellaneous land types, such as Rock land, are described in alphabetic order along with other mapping units.

After the name of each mapping unit there is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. At the end of the description of each mapping unit are listed the capability unit and woodland suitability group in which the mapping unit has been placed. The pages where these groups are described can be readily learned by referring to the "Guide to Mapping Units."

For more general information about the soils, the reader can refer to the section "General Soil Map," in which the broad patterns of soils are described. Many of the terms used in the soil descriptions and other parts of the survey are defined in the Glossary.

Ashe Series

The Ashe series consists of shallow to moderately deep, somewhat excessively drained, moderately steep to very steep soils overlying weathered rock. These soils occur at elevations of more than 1,400 feet on rough, mountainous terrain in the northern and northwestern parts of the county. They formed in residuum weathered from granite and gneiss. The shallower soils are on ridgetops, and the deeper soils on side slopes.

In a representative profile the surface layer is very dark grayish-brown sandy loam about 4 inches thick. The subsoil is yellowish-brown sandy loam about 10 inches thick. This is underlain by weathered, coarse-grained granitic material. Moderately hard rock is at a depth of about 32 inches. The rock contains many fractures.

The organic-matter content is high in the uppermost 4 inches but is low below that depth. The available water capacity is low. Infiltration is moderately rapid, and permeability is moderately rapid to a depth of 14 inches but is rapid below that depth. Fertility is low.

These soils are under forest cover, mainly hardwoods.

Representative profile of Ashe sandy loam, 10 to 25 percent slopes, in a wooded area, 3¼ miles southwest of Rocky Bottom:

O1—1½ inches to ½ inch, loose leaves, undecomposed.
O2—½ inch to 0, matted organic debris, partly decomposed.
A1—0 to 4 inches, very dark grayish-brown (10YR 3/2) sandy loam; moderate, medium, granular structure; very friable; many roots; a few quartz pebbles 5 to 25 millimeters in diameter; strongly acid, pH 5.2; abrupt, smooth boundary.
B—4 to 14 inches, yellowish-brown (10YR 5/4) sandy loam; weak, medium, granular structure; very friable; many roots; many krotovinas; a few quartz pebbles 5 to 15 millimeters in diameter; few fine mica flakes; strongly acid, pH 5.3; clear, wavy boundary.
C—14 to 32 inches, weathered, coarse-grained granitic material that crushes to loamy sand; structureless; friable; very strongly acid; gradual, wavy boundary.
R—32 inches +, moderately hard granite gneiss.

The A1 horizon ranges from very dark grayish brown to dark grayish brown in color and from 4 to 5 inches in thickness. The B horizon is light yellowish-brown, yellowish-brown, or grayish-brown sandy loam. It ranges from 10 to 20 inches in thickness. The C horizon is finely mottled gray, white, pale-brown, or black weathered rock that crushes to sandy loam or loamy sand. It ranges from a few inches to many feet in thickness. The C horizon is slightly weathered to highly weathered rock. The slightly weathered rock is difficult to cut with hand tools, but the highly weathered rock is easily cut. The depth to hard rock ranges from about 2 feet to more than 10 feet. These soils are strongly acid to very strongly acid in the A, B, and C horizons.

Ashe soils are geographically associated with Hayesville, Edneyville, and Porters soils. They have a less well developed subsoil than those soils.

Ashe sandy loam, 10 to 25 percent slopes (AsE).—This soil has the profile described as representative of the series. It is shallow to moderately deep over weathered rock (fig. 2). Included in mapping were a few gravelly areas and a few small areas where rock crops out. The included areas make up less than 7 percent of the acreage.

This soil is not suited to cultivation, but it can be used for permanent pasture or perennial vegetation. Erosion is a very severe hazard. All the acreage is in hardwoods. (Capability unit VIe-2; woodland suitability group 3r2)

Ashe sandy loam, 25 to 40 percent slopes (AsF).—This soil formed in residuum weathered from granite and gneiss. Included in mapping were a few small areas of Stony land and a few small areas of Saluda soils. Also included were a few small areas where the surface layer is gravelly sandy loam. The included areas make up less than 8 percent of the acreage.

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soil	Acres	Percent	Soil	Acres	Percent
Ashe sandy loam, 10 to 25 percent slopes	312	0.1	Hiwassee clay loam, 2 to 6 percent slopes, eroded	1,176	.4
Ashe sandy loam, 25 to 40 percent slopes	2,101	.7	Hiwassee clay loam, 6 to 10 percent slopes, severely eroded	5,423	1.7
Ashe sandy loam, 40 to 90 percent slopes	8,871	2.7	Hiwassee clay loam, 10 to 25 percent slopes, severely eroded	9,173	2.8
Buncombe loamy sand	455	.1	Louisburg sandy loam, 10 to 25 percent slopes	290	.1
Cataula sandy loam, 2 to 6 percent slopes, eroded	627	.2	Louisburg sandy loam, 25 to 40 percent slopes	376	.1
Cataula sandy loam, 6 to 10 percent slopes, eroded	337	.1	Madison sandy loam, 2 to 6 percent slopes, eroded	2,072	.6
Cataula clay loam, 6 to 15 percent slopes, severely eroded	3,308	1.0	Madison sandy loam, 6 to 10 percent slopes, eroded	4,268	1.3
Cecil sandy loam, 2 to 6 percent slopes, eroded	14,799	4.6	Madison sandy loam, 10 to 25 percent slopes, eroded	6,666	2.1
Cecil sandy loam, 6 to 10 percent slopes, eroded	25,950	8.0	Madison clay loam, 10 to 25 percent slopes, severely eroded	1,642	.5
Cecil sandy loam, 10 to 15 percent slopes, eroded	13,487	4.1	Musella soils, 40 to 80 percent slopes	631	.2
Cecil clay loam, 2 to 6 percent slopes, severely eroded	1,529	.5	Pacolet fine sandy loam, 2 to 6 percent slopes, eroded	984	.3
Cecil clay loam, 6 to 10 percent slopes, severely eroded	8,446	2.6	Pacolet fine sandy loam, 6 to 10 percent slopes, eroded	5,553	1.7
Chewacla loam	3,463	1.0	Pacolet fine sandy loam, 10 to 25 percent slopes, eroded	40,128	12.3
Chewacla soils, frequently flooded	4,560	1.5	Pacolet fine sandy loam, 25 to 40 percent slopes	27,798	8.6
Clifton fine sandy loam, 15 to 35 percent slopes	439	.1	Pacolet fine sandy loam, 40 to 80 percent slopes	8,116	2.5
Edneyville fine sandy loam, 10 to 25 percent slopes	662	.2	Pacolet clay loam, 2 to 10 percent slopes, severely eroded	1,875	.6
Edneyville fine sandy loam, 25 to 40 percent slopes	789	.2	Pacolet clay loam, 10 to 25 percent slopes, severely eroded	21,698	6.7
Edneyville fine sandy loam, 40 to 80 percent slopes	3,562	1.1	Porters loam, 15 to 40 percent slopes	641	.2
Grover fine sandy loam, 15 to 25 percent slopes	1,957	.6	Porters loam, 40 to 70 percent slopes	2,878	.9
Grover fine sandy loam, 2 to 6 percent slopes, eroded	1,090	.3	Rabun loam, 10 to 25 percent slopes	483	.1
Grover fine sandy loam, 6 to 15 percent slopes, eroded	2,791	.9	Rabun cobbly loam, 25 to 40 percent slopes	491	.2
Grover fine sandy loam, 25 to 40 percent slopes	5,157	1.6	Rabun cobbly loam, 40 to 70 percent slopes	2,012	.6
Grover fine sandy loam, 40 to 80 percent slopes	10,258	3.1	Rock land	1,100	.3
Gwinnett sandy loam, 25 to 40 percent slopes	2,757	.9	Saluda sandy loam, 10 to 25 percent slopes	1,471	.5
Gwinnett sandy loam, 40 to 60 percent slopes	624	.2	Saluda sandy loam, 25 to 40 percent slopes	3,622	1.1
Hayesville fine sandy loam, 15 to 40 percent slopes	709	.2	Saluda sandy loam, 40 to 70 percent slopes	6,053	1.9
Hayesville fine sandy loam, 40 to 80 percent slopes	1,373	.4	Starr loam, 0 to 6 percent slopes	1,373	.4
Helena sandy loam, 2 to 6 percent slopes	378	.1	Stony land	7,340	2.3
Hiwassee sandy loam, 2 to 6 percent slopes, eroded	6,044	1.9	Tallapoosa loam, 25 to 40 percent slopes	443	.1
Hiwassee sandy loam, 6 to 10 percent slopes, eroded	6,449	2.0	Tallapoosa loam, 6 to 15 percent slopes	549	.2
Hiwassee sandy loam, 10 to 25 percent slopes, eroded	11,705	3.6	Tallapoosa loam, 15 to 25 percent slopes	774	.2
			Tallapoosa loam, 40 to 80 percent slopes	461	.1
			Toccoa soils	9,687	3.0
			Tusquitee loam, 4 to 10 percent slopes	582	.2
			Worsham sandy loam, 2 to 6 percent slopes	1,369	.4
			Water	799	.2
			Total	324,986	100.0

Figure 2.—**An area of Ashe sandy loam, 10 to 25 percent slopes. The deep cut shows 10 to 20 inches of soil overlying material weathered from gneiss.**

This soil is not suited to cultivation or pasture. Runoff is very rapid, and erosion is a severe hazard. An adequate forest cover should be maintained at all times. (Capability unit VIIe–2; woodland suitability group 3r2)

Ashe sandy loam, 40 to 90 percent slopes (AsG).—This soil formed in residuum weathered from granite and gneiss. Included in mapping were a few small areas of Stony land and a few small areas of Saluda soils. The included areas make up less than 7 percent of the acreage.

On this soil, runoff is very rapid and erosion is a very severe hazard. Protective forest cover should be maintained at all times. Harvesting timber and construction of roads are difficult because of the slope. (Capability unit VIIe–2; woodland suitability group 3r3)

Buncombe Series

The Buncombe series consists of deep, excessively drained, sandy soils on flood plains along the major streams. The areas are irregular in shape.

In a representative profile the surface layer is very dark grayish-brown loamy sand about 8 inches thick. Below this is dark yellowish-brown loamy sand about 50 inches or more thick.

The inherent fertility and the organic-matter content are generally low. Infiltration is rapid, and permeability is moderately rapid. The available water capacity is low.

Most of the acreage is in forest, but some areas are cultivated or in pasture. All areas are subject to flooding.

Representative profile of Buncombe loamy sand, in a cultivated field on the east bank of Eastatoe Creek, about 3½ miles south-southwest of Rocky Bottom:

Ap—0 to 8 inches, very dark grayish-brown (10YR 3/2) loamy sand; weak, medium, granular structure; very friable; many fine roots; many large pores; few fine mica flakes; medium acid; clear, smooth boundary.

C—8 to 60 inches, dark yellowish-brown (10YR 4/4) loamy sand; weak, medium, granular structure; loose; few fine roots; few fine mica flakes; few, fine, dark-colored minerals; medium acid.

The Ap horizon ranges from very dark grayish brown to yellowish brown. The C horizon ranges from dark yellowish brown to pale brown in color and from 30 to 60 inches or more in thickness. Mica flakes are few to common. These soils are slightly acid to medium acid throughout.

Buncombe soils are geographically associated with Chewacla and Toccoa soils. They are coarser textured than those soils.

Buncombe loamy sand (Bu).—This soil is nearly level. It occurs inextensively along the major streams. The areas are parallel to the stream channel and about 5 acres in size. The soil is usually flooded one to three times annually.

Included in mapping were a few small areas of Toccoa soils. Also included were a few areas where the soil contains rounded gravel throughout the profile. The included areas make up less than 5 percent of the acreage.

Tilth is excellent, and the soil can be cultivated throughout a wide range of moisture content. Droughtiness is a limitation. About 35 percent of this soil is used for pasture or crops, and 65 percent for woodland. (Capability unit IIIs–2; woodland suitability group 2s8)

Cataula Series

The Cataula series consists of well-drained, shallow to moderately deep soils that have a fragipan. These soils developed in material weathered from granite and gneiss.

In a representative profile the surface layer is yellowish-red sandy loam about 4 inches thick. The underlying layers are red clay loam in the upper part and dense, compact and very firm, red sandy clay loam in the lower part. They are mottled, at a depth below 19 inches, with yellowish red and yellowish brown. Weak-red, red, and brown fine sandy loam saprolite is at a depth of about 34 inches.

The natural fertility and the organic-matter content are low. Infiltration is moderate. Permeability is slow, and the available water capacity is medium.

Most of the gently sloping and sloping areas of Cataula soils are used for general farming. Most of the other areas are used for loblolly pines.

Representative profile of Cataula sandy loam, 2 to 6 percent slopes, eroded, in a cultivated field, 2½ miles southeast of Easley:

Ap—0 to 4 inches, yellowish-red (5YR 4/6) sandy loam; weak, medium, granular structure; very friable; many roots; a few, fine, angular fragments of quartz; strongly acid, pH 5.3; abrupt, smooth boundary.

B21t—4 to 12 inches, red (2.5YR 4/6) clay loam; moderate, medium, subangular blocky structure; very firm, very dense and compact, slightly sticky and plastic, hard; a few fine roots; few fine pores; continuous clay films on ped faces; medium acid, pH 5.8; clear, smooth boundary.

B22t—12 to 19 inches, dark-red (2.5YR 3/6) clay loam; few, fine, distinct mottles of yellowish red; moderate, medium, platy structure parting to medium, subangular blocky; extremely firm; very dense and compact; few fine roots; few fine pores; continuous clay films on ped faces; medium acid, pH 5.7; clear, wavy boundary.

Bx—19 to 34 inches, red (2.5YR 4/6) sandy clay loam; few, fine, distinct mottles of yellowish red and yellowish brown; moderate, medium, subangular blocky structure; very firm and brittle; a few fine roots; very few fine pores; many fine grains of quartz and very few fine mica flakes; continuous clay films on ped faces; medium acid, pH 5.8; diffuse, wavy boundary.

C—34 to 50 inches, weak-red, red, and brown saprolite of fine sandy loam; massive; structureless; friable; common fine mica flakes; strongly acid.

In eroded areas the Ap horizon is friable sandy loam that ranges from 3 to 8 inches in thickness and from dark brown to yellowish red in color. In severely eroded areas the Ap horizon is yellowish-red to red clay loam and ranges from 2 to 5 inches in thickness. The Bt horizon is yellowish-red, red, or dark-red clay loam or clay and ranges from 12 to 24 inches in thickness. The Bx horizon has few to many mottles and ranges from sandy clay loam to sandy clay in texture and from 12 to 30 inches in thickness. The Bx horizon ranges from platy to subangular blocky in structure. These soils are medium acid to strongly acid in the A and B horizons and strongly acid to very strongly acid in the C horizon.

Cataula soils are geographically associated with Cecil, Hiwassee, and Madison soils. They closely resemble Cecil soils but the Cataula subsoil is much firmer and denser, more mottled, and less permeable than that of Cecil soils. Cataula soils have a fragipan, which is lacking in Cecil, Hiwassee, and Madison soils.

Cataula sandy loam, 2 to 6 percent slopes, eroded (CdB2).—This soil has the profile described as representative of the series. It occurs on smooth, broad ridgetops and short to long side slopes. The areas are irregular in shape and are widely scattered, but they occur mainly in the central and southern parts of the county.

Erosion has removed 25 to 75 percent of the original surface layer. Tillage commonly incorporates some of the subsoil into the plow layer.

Included in mapping were a few small areas where the surface layer is clay loam and a few areas where the sandy loam surface layer is 8 inches thick. Also included were a few areas where the surface layer is gravelly, and small areas of Hiwassee soils. The included areas make up less than 10 percent of the acreage.

This soil is moderately responsive to applications of lime and fertilizer. Because of slow permeability, the subsoil remains relatively dry throughout most of the growing season. (Capability unit IIIe–3; woodland suitability group 3o7)

Cataula sandy loam, 6 to 10 percent slopes, eroded (CdC2).—This soil is inextensive. It occurs on short to long side slopes. The areas are irregular in shape.

Erosion has removed 25 to 75 percent of the original surface layer. Rills and thin spots expose the subsoil in a few places.

Included in mapping were a few small areas where the surface layer is clay loam and a few areas where the surface layer is gravelly. Other inclusions are a few small areas of Helena and Hiwassee soils and a few small areas where the subsoil is yellowish red. The included areas make up less than 10 percent of the acreage.

Because of slow permeability, the subsoil remains relatively dry throughout the growing season. Erosion is a very severe hazard.

Most of this soil is in row crops; a small acreage is used for pasture. Crops respond to applications of lime and fertilizer. (Capability unit IVe–2; woodland suitability group 3o7)

Cataula clay loam, 6 to 15 percent slopes, severely eroded (CaD3).—This soil occurs on moderately long side slopes. The areas are irregular in shape. The profile of this soil is similar to the profile described as representative of the series, except that the surface layer is clay loam and the combined thickness of the surface layer and subsoil is about 6 inches less than that of the representative soil. In many places, erosion has removed all of the original surface layer and as much as 25 percent of the subsoil.

Included in mapping were areas where the surface layer is sandy loam and a few areas where quartz gravel is on the surface. The included areas make up less than 7 percent of the acreage.

Erosion is a severe hazard. This soil is not suited to row crops. Good management is needed to provide adequate cover at all times. (Capability unit VIe–3; woodland suitability group 5c3e)

Cecil Series

The Cecil series consists of deep, well-drained, gently sloping to strongly sloping soils that formed in material weathered from granite and gneiss. These soils are on broad upland areas that have long side slopes.

In a representative profile the surface layer is yellowish-red sandy loam about 5 inches thick. The upper part of the subsoil is dominantly red, firm clay 24 inches thick. Beneath this layer is about 22 inches of firm, red clay loam. This is underlain by reddish sandy clay loam saprolite.

The natural fertility and organic-matter content are low. Infiltration and permeability are moderate, and the available water capacity is medium.

About 60 percent of the acreage is in woodland. The rest is in crops or pasture.

Representative profile of Cecil sandy loam, 2 to 6 percent slopes, eroded, in a cultivated field, three-tenths of a mile south-southwest of intersection of U.S. Highway 178 and South Carolina Highway 135:

Ap—0 to 5 inches, yellowish-red (5YR 4/6) sandy loam; weak, medium, granular structure; very friable; many roots; many large pore spaces; strongly acid, pH 5.1; abrupt, smooth boundary.

B1t—5 to 8 inches, red (2.5YR 4/6) clay loam; weak, medium, subangular blocky structure; friable; many small and medium roots; many small and medium pores; few, thin, patchy clay films; strongly acid, pH 5.1; clear, smooth boundary.

B2t—8 to 32 inches, red (10R 4/6) clay; moderate, medium, subangular blocky structure; firm, sticky and slightly plastic, hard; many small roots; many small pore spaces; a few small root holes; continuous clay films; strongly acid, pH 5.3; gradual, smooth boundary.

B3t—32 to 54 inches, red (10R 4/6) clay loam; weak, medium and coarse, subangular blocky structure; firm; few fine roots; few fine and medium pores; few fine mica flakes; thin clay films; strongly acid, pH 5.2; diffuse, wavy boundary.

C—54 to 64 inches, +, reddish sandy clay loam saprolite material; massive; friable; common fine mica flakes; few small fragments of rock; strongly acid.

The A1 horizon, where present, is dark brown to very dark grayish brown. The darker color occurs in woodland areas where this horizon is covered with an organic horizon. The A1 horizon ranges from 1½ to 5 inches in thickness.

The A2 horizon, where present, is yellowish brown, yellowish red, dark grayish brown, or brown. It ranges from 3 to 6 inches in thickness. In cultivated areas the A1 and A2 horizons are mixed. In these areas the Ap horizon is grayish-brown, brown, yellowish-red, or red sandy loam to clay loam 3 to 7 inches thick. The A horizon is medium acid to strongly acid.

The B1t horizon ranges from yellowish red to red in color and from 2 to 5 inches in thickness. The B2t horizon is clay to clay loam 24 to 40 inches thick. In places this horizon contains a few fine distinct mottles of yellowish red and yellowish brown. The B3 horizon is yellowish-red, red, or light-red clay loam or sandy clay loam 8 to 30 inches thick. In places it contains mottles of pale brown to strong brown; in other places it contains common weathered fragments of rock. The B horizon is medium acid to very strongly acid. The depth to the C horizon ranges from 40 to 60 inches. The C horizon is strongly acid to very strongly acid.

Cecil soils are geographically associated with Madison, Hiwassee, Grover, and Pacolet soils. They have a red subsoil, unlike Hiwassee soils, which have a dark-red subsoil. Cecil soils are similar in color to Madison soils, but they contain less mica. They have a redder subsoil than Grover soils and a thicker solum than Pacolet soils.

Cecil sandy loam, 2 to 6 percent slopes, eroded (C1B2).—This soil has the profile described as representative of the series. It occurs on smooth, broad ridgetops and short to long side slopes. The areas are irregular in shape.

Erosion has removed 25 to 75 percent of the original surface layer, and in a few places the subsoil is exposed. Tillage commonly includes some of the subsoil. The surface layer is yellowish-red, friable sandy loam 3 to 7 inches thick. The subsoil is red, firm clay or clay loam 40 to 55 inches thick.

Included in mapping were a few small, severely eroded areas. In these areas the surface layer is clay loam. Also included were a few small areas where the slope is outside the range for this soil. Other inclusions are small areas of Madison, Hiwassee, and Grover soils. The included areas make up less than 15 percent of the acreage.

Tilth is good, and the soil can be tilled throughout a wide range of moisture content. Runoff is medium.

This soil is well suited to all the commonly grown crops and pasture grasses. About 65 percent of the acreage is cultivated, and 35 percent is woodland. Crops respond well to applications of lime and fertilizer. (Capability unit IIe–1; woodland suitability group 3o7)

Cecil sandy loam, 6 to 10 percent slopes, eroded (C1C2).—This soil occurs on long side slopes and broad ridgetops. The areas occur in irregular patterns and are about 10 to 100 acres in size.

Erosion has removed 25 to 75 percent of the original surface layer. In a few places the subsoil is exposed. Tillage commonly includes some of the subsoil. The surface layer is dark grayish-brown to yellowish-red, friable sandy loam about 3 to 7 inches thick. The subsoil is red, firm clay to clay loam 40 to 55 inches thick.

Included in mapping were a few small areas where the surface layer is gravelly sandy loam and clay loam. Also included were a few small areas of Madison, Hiwassee, and Grover soils. The included areas make up less than 10 percent of the acreage.

Tilth is good, and the soil can be tilled throughout a wide range of moisture content. Runoff is rapid, and erosion is a moderately severe hazard.

About 35 percent of this soil is used for crops, 35 percent for pasture, and 30 percent for woodland. Crops respond well to applications of lime and fertilizer. (Capability unit IIIe–1; woodland suitability group 3o7)

Cecil sandy loam, 10 to 15 percent slopes, eroded (C1D2).—This soil is strongly sloping. It occurs on short to long side slopes.

Erosion has removed 25 to 75 percent of the original surface layer, and in a few places the subsoil is exposed. Tillage commonly includes some of the subsoil. The surface layer is dark grayish-brown to yellowish- red, friable sandy loam 3 to 6 inches thick. The subsoil is red, firm clay or clay loam about 30 to 50 inches thick.

Included in mapping were a few small areas where the surface layer is clay loam and some areas where it is gravelly sandy loam. Also included were a few small areas of Madison, Hiwassee, and Grover soils. In only a few included areas, the slope is outside the range for this soil. The included areas make up about 7 percent of the acreage.

Most of the acreage is in woodland and pasture. These areas respond to good management. Runoff is rapid, and the severe erosion hazard limits the use of this soil for row

crops. (Capability unit IVe–1; woodland suitability group 3o7)

Cecil clay loam, 2 to 6 percent slopes, severely eroded (CeB3).—This soil occurs on broad ridgetops and gently rolling uplands. Slopes are long, and areas are irregular in shape.

Erosion has removed 75 to 100 percent of the original sandy loam surface layer and as much as 25 percent of the subsoil. The surface layer is red to yellowish-red clay loam about 5 inches thick. The subsoil is reddish clay to clay loam 30 to 55 inches thick. Tillage is mostly in the subsoil.

Included in mapping were small areas where the surface layer is sandy loam, gravelly sandy loam, or clay. Also included were small areas of Madison, Hiwassee, and Grover soils. The included areas make up about 8 percent of the acreage.

Tilth is poor. Runoff is medium, and erosion is a severe hazard. About 60 percent of the acreage is used for crops, and 40 percent for woodland. Crops respond moderately well to applications of lime and fertilizer. (Capability unit IIIe–1; woodland suitability group 4c2e)

Cecil clay loam, 6 to 10 percent slopes, severely eroded (CeC3).—This soil occurs on long side slopes and ridgetops. The areas are irregular in shape and average 5 to 50 acres in size.

Erosion has removed 75 to 100 percent of the original surface layer and, in many places, as much as 25 percent of the subsoil. Rills are numerous, and there are a few shallow gullies. Tillage is essentially in the subsoil. The surface layer is friable, yellowish-red to red clay loam 3 to 5 inches thick. The subsoil is firm red clay to clay loam 30 to 55 inches thick.

Included in mapping were a few small areas where the surface layer is sandy loam, gravelly sandy loam, or clay. Also included were a few small areas of Madison, Hiwassee, and Grover soils. The included areas make up about 8 percent of the acreage.

Tilth is poor. The soil can be tilled only within a narrow range of moisture content.

About 15 percent of the acreage is used for crops, 25 percent for pasture, and 60 percent for woodland. Crops respond moderately well to applications of lime and fertilizer. (Capability unit IVe–1; woodland suitability group 4c2e)

Chewacla Series

The Chewacla series consists of deep, somewhat poorly drained soils that developed in alluvium. These soils are on low first bottoms along the major streams. They are subject to flooding.

In a representative profile the surface layer is dark-brown loam about 8 inches thick. The upper part of the subsoil is dark-brown clay loam and silty clay loam about 18 inches thick. The lower part is light brownish-gray silty clay loam about 26 inches thick. The water table fluctuates between 18 and 30 inches. Mottling commonly occurs at a depth of about 16 inches.

Fertility is moderate, and the organic-matter content is medium. Infiltration and permeability are moderate, and the available water capacity is medium to high.

Most of the acreage is used for pasture or corn. Runoff and internal drainage are slow

Representative profile of Chewacla loam, in a pasture, on Georges Creek, three-quarters of a mile west of the confluence with the Saluda River:

Ap—0 to 8 inches, dark-brown (10YR 4/3) loam; weak, fine, granular structure; very friable; many fine roots; many fine and medium pores; few fine mica flakes; strongly acid, pH 5.1; clear, smooth boundary.

B21—8 to 16 inches, dark-brown (7.5YR 4/4) clay loam; weak, fine, granular structure; friable; many fine and medium roots; many fine pores; few fine mica flakes; strongly acid, pH 5.4; abrupt, smooth boundary.

B22—16 to 26 inches, dark-brown (7.5YR 4/4) silty clay loam; few, fine, faint mottles of strong brown and grayish brown; weak, medium, subangular blocky structure; friable; many fine and medium roots; few medium pores; few fine mica flakes; strongly acid, pH 5.3; gradual, wavy boundary.

B3g—26 to 52 inches, light brownish-gray (2.5Y 6/2) silty clay loam; many, medium, prominent mottles of strong brown (7.5YR 5/6), yellowish brown (10YR 5/6), and weak red (2.5YR 5/2); massive; friable; few fine and medium roots; few medium pores; few fine mica flakes that become more numerous as depth increases; few dark-brown concretions; strongly acid, pH 5.4.

The solum ranges from about 50 to 72 inches in thickness. The A horizon is brown, dark-brown, dark yellowish-brown, or reddish-brown loam, silt loam, or fine sandy loam. It ranges from 6 to 10 inches in thickness. The B2 horizon is yellowish-brown, dark yellowish-brown, brown, dark-brown, or reddish-brown clay loam, loam, or silty clay loam. The B3g horizon is grayish brown, light brownish gray, gray, brown, yellowish brown, strong brown, or weak red, or it is mottled with these colors. The texture of this horizon is silty clay loam, loam, fine sandy loam, sandy clay loam, or clay loam. Mottles that have a chroma of 2 or less are within 20 inches of the surface. Except where limed, the soils are strongly acid to medium acid throughout. Mica flakes in the profile range from few to common.

Chewacla soils are geographically associated with Toccoa soils. They are more poorly drained than those soils.

Chewacla loam (Cm).—This soil is nearly level. It occurs extensively on low bottom lands along the major streams. It has the profile described as representative of the series. Included in mapping were a few small areas of Toccoa soils. The included areas make up less than 5 percent of the acreage.

Most of this soil is used for pasture or crops. Corn is the principal crop. Most areas are subject to occasional flooding, and some crop damage is to be expected. (fig. 3). The water table fluctuates seasonally but ranges from about 18 to 30 inches.

In a few places flood control structures have been installed, and the soil is protected from floodwaters. In these areas tile drainage is moderately effective. (Capability unit IIIw–2; woodland suitability group 1w8)

Chewacla soils, frequently flooded (Co).—These are deep, nearly level, somewhat poorly drained soils on flood plains along the major streams. They are flooded for a period of 1 to 5 days several times a year. These soils have the profile described as representative of the series, except that the surface layer is brown to dark yellowish-brown silt loam, loam, or fine sandy loam 6 to 8 inches thick.

These soils are generally not suited to row crops or improved grasses in their natural state. If drained and protected from flooding, however, they are suited to these uses. (Capability unit Vw–2; woodland suitability group 1w8)

Figure 3.—Corn on Chewacla soils. In the right foreground, the corn crop on Chewacla loam shows damage from excess water. In the left foreground, the crop on Chewacla soils, frequently flooded, has failed.

Clifton Series

The Clifton series consists of well-drained soils that are deep to moderately deep over weathered rock. These soils formed in material weathered from hornblende gneiss, hornblende schist, and diorite. They occur on mountains in the northern part of the county.

In a representative profile the surface layer is dark reddish-brown fine sandy loam about 6 inches thick. The subsoil is yellowish-red, friable clay and clay loam about 30 inches thick. The depth to broken rock is 2 feet to more than 5 feet.

Natural fertility is moderate, and the organic-matter content is low. Infiltration is moderately rapid. Permeability is moderate, and the available water capacity is medium.

These soils are used for broadleaf trees.

Representative profile of Clifton fine sandy loam, 15 to 35 percent slopes, in an area of native hardwoods, 800 feet north of Camp Adger and 6,800 feet southwest of Pinnacle Mountain:

O1—2½ inches to 1 inch, loose leaves.

O2—1 inch to 0, matted organic matter, partly decomposed.

A1—0 to 6 inches, dark reddish-brown (5YR 3/4) fine sandy loam; moderate, medium, granular structure; very friable; many medium and fine roots; few small fragments of dark-colored rock; medium acid, pH 5.6; clear, smooth boundary.

B1t—6 to 15 inches, yellowish-red (5YR 4/6) clay loam; moderate, medium and fine, subangular blocky structure; friable; thin, discontinuous clay films; many fine roots and a few medium roots; few thin fragments of dark-colored rock; medium acid, pH 5.7; gradual, smooth boundary.

B2t—15 to 27 inches, yellowish-red (5YR 4/6) clay; moderate, medium, subangular blocky structure; friable; plastic and sticky, and hard; thin clay films; few fine and medium roots; few fine pores; few small fragments of dark-colored rock; medium acid, pH 5.7; gradual, smooth boundary.

B3t—27 to 36 inches, reddish-brown (2.5YR 4/4) clay loam; weak, medium and coarse, subangular blocky structure; friable; few, thin, patchy clay films; few fine roots; common soft and hard fragments of dark-colored rock; few fine mica flakes; medium acid, pH 5.8; gradual, wavy boundary.

C—36 to 50 inches +, yellowish-brown (10YR 5/6) and yellowish-red (5YR 4/6) weathered rock material; structureless; many fragments of rock; common fine sand grains and fine mica flakes.

The solum ranges from 20 to 40 inches in thickness. The A horizon ranges from dark reddish brown to strong brown in color and from 5 to 8 inches in thickness. The Bt horizon ranges from clay to clay loam in texture and from 18 to 35 inches in thickness. It is friable to firm. The C horizon is slightly weathered to highly weathered saprolite from hornblende gneiss, schist, and other rocks. It ranges from sandy loam to sandy clay loam in texture and from a few inches to several feet in thickness. The depth to hard rock ranges from 2 to 5 feet. These soils are medium acid to strongly acid throughout.

Clifton soils are geographically associated with Porters, Ashe, and Rabun soils. They have a Bt horizon, which is lacking in Ashe soils. They have a redder Bt horizon than Porters soils. Clifton soils have a dominantly yellowish-red Bt horizon; Rabun soils have a dark-red Bt horizon.

Clifton fine sandy loam, 15 to 35 percent slopes (CtF).—This soil occurs on narrow ridgetops and side slopes on mountains. Included in mapping were a few small areas of Rabun soils. Also included were a few small areas where the surface layer is gravelly or stony. A few areas were included where the slope is outside the range for this soil. The included areas make up less than 15 percent of the acreage.

All the acreage is in native hardwoods. The steep slope makes the soil unsuitable for cultivation. This soil can be used for limited grazing when planted to perennial vegetation. (Capability unit VIe–1; woodland suitability group 2r8)

Edneyville Series

The Edneyville series consists of well-drained soils that are moderately deep to deep over weathered rock. These soils formed in material weathered from granite and gneiss, on mountains. Elevations range from 1,400 to about 3,500 feet.

In a representative profile the surface layer is very dark grayish-brown over yellowish-brown fine sandy loam. The subsoil is yellowish-brown sandy clay loam over sandy loam. Deeply weathered sandy loam saprolite begins at a depth of about 26 inches.

Fertility is moderate, and the organic-matter content is medium. Infiltration is moderately rapid. Permeability is moderate to a depth of about 26 inches and is rapid below that depth. The available water capacity is medium.

Most areas of these soils are in native hardwoods.

Representative profile of Edneyville fine sandy loam, 10 to 25 percent slopes, in an area of hardwoods, 5 miles west of Rocky Bottom:

O1—2 inches to ½ inch, loose leaves and organic matter, largely undecomposed.

O2—½ inch to 0, matted organic matter, partly decomposed.

A1—0 to 2 inches, very dark grayish-brown (10YR 3/2) fine sandy loam; moderate, medium, granular structure; very friable; many medium roots; a few fragments of quartz ranging from 5 to 15 millimeters in size; very strongly acid, pH 5.0; abrupt, smooth boundary.

A2—2 to 7 inches, yellowish-brown (10YR 5/6) fine sandy loam; moderate, medium, granular structure; very friable; many fine and medium roots; a few, small, angular fragments of quartz about 10 millimeters in diameter; very strongly acid, pH 4.8; clear, smooth boundary.

B2t—7 to 19 inches, yellowish-brown (10YR 5/6) sandy clay loam; weak, medium, angular blocky structure; friable; many medium roots; many large and medium pores; sand grains coated and bridged; very strongly acid, pH 4.7; clear, smooth boundary.

B3—19 to 26 inches, yellowish-brown (10YR 5/6) sandy loam; weak, medium to coarse, angular blocky structure; very friable; many fine roots and a few medium-size roots; very strongly acid, pH 4.7; gradual, wavy boundary.

C—26 to 40 inches, deeply weathered saprolite from granite; sandy loam texture; rock-controlled structure; very strongly acid.

The solum ranges from 20 to 40 inches in thickness. The A1 horizon ranges from 2 to 4 inches in thickness and from very dark grayish brown to dark grayish brown in color. The A2 horizon ranges from 4 to 6 inches in thickness and from yellowish brown to light yellowish brown in color. The B2 horizon is brownish-yellow, yellowish-brown, or strong-brown sandy clay loam to light clay loam. It ranges from about 12 to 24 inches in thickness. The B3 horizon is yellowish-brown sandy clay loam to sandy loam and ranges from about 6 to 18 inches in thickness. The depth to hard rock ranges from about 2 to 20 feet. These soils are strongly acid to very strongly acid throughout.

Edneyville soils commonly adjoin Hayesville, Porters, and Ashe soils. They have a browner subsoil than Hayesville soils. Their surface layer is thinner and lighter in color than that of Porters soils. They have a thicker solum and a more strongly developed subsoil than Ashe soils.

Edneyville fine sandy loam, 10 to 25 percent slopes (EdE).—This soil has the profile described as representative of the series (fig. 4). It occurs on short to long side slopes. The areas are irregular in shape.

Included in mapping were a few small areas where the surface layer is eroded and about 4 to 6 inches thick. A few areas were included where the surface layer is loam or sandy loam. Also included were a few gravelly or stony areas. A few small areas of Ashe soils and a few areas where the subsoil is yellowish red were included. The included areas make up less than 10 percent of the acreage.

Tilth is good. Crops respond well to applications of lime and fertilizer.

This soil is in native hardwoods, except for a few small, abandoned fields that are now in pines. (Capability unit VIe–1; woodland suitability group 2r8)

Edneyville fine sandy loam, 25 to 40 percent slopes (EdF).—This soil is on long slopes. The areas are irregular in shape.

Included in mapping were a few small areas where the surface layer is loam or sandy loam 4 to 6 inches thick. Also included were gravelly or stony areas. In addition, there are a few small areas of Ashe soils and small areas of Saluda soils. The included areas make up less than 10 percent of the acreage.

Tilth is good. This soil is in native hardwoods, to which it is well suited. (Capability unit VIIe–2; woodland suitability group 2r8)

Edneyville fine sandy loam, 40 to 80 percent slopes (EdG).—This soil occurs on short to long slopes. Included in mapping were a few small areas of Ashe soils and a few areas of Saluda soils. The included areas make up less than 10 percent of the acreage.

Tilth is good. Runoff is very rapid. An adequate forest cover should be maintained at all times to control loss of soil and water. All the acreage is in native hardwoods. (Capability unit VIIe–2; woodland suitability group 2r9)

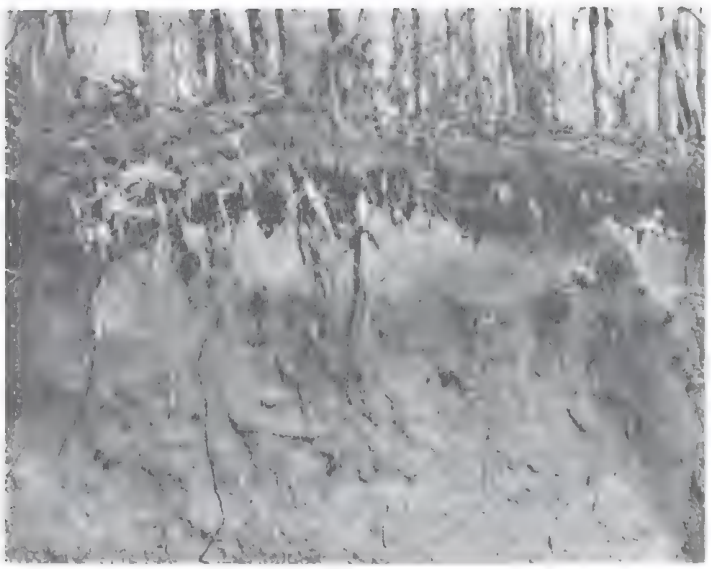

Figure 4.—**An area of Edneyville fine sandy loam, 10 to 25 percent slopes. Roots penetrate deep into the weathered rock.**

Grover Series

The Grover series consists of moderately deep to deep, well-drained soils overlying weathered rock. These soils formed in material weathered from micaceous rocks. The rocks are mainly quartz mica schist, micaceous granite and gneiss, muscovite, sericite schist, and talcose schist.

These soils are widely distributed throughout the Piedmont area of the county. They occur on uplands at elevations ranging from 700 to 1,400 feet. In the southern part of the county, they are on long slopes. The slope ranges from 2 to 15 percent, but in most places it is about 7 percent. In the central and northern parts of the county, the slope is as much as 80 percent.

In a representative profile the surface layer is dark grayish-brown fine sandy loam about 3 inches thick. The subsurface layer is dark yellowish-brown fine sandy loam about 4 inches thick. The subsoil is yellowish-red sandy clay loam. Reddish-yellow weathered rock begins at a depth of about 28 inches.

The natural fertility and the organic-matter content are low. Infiltration and permeability are moderate, and the available water capacity is medium.

Most of the acreage has been cultivated, except where the soils are steep. All the commonly grown crops are well suited. Crops respond to liberal applications of lime and fertilizer.

Representative profile of Grover fine sandy loam, 15 to 25 percent slopes, in a forest area, 2¾ miles northeast of Jocassee Dam:

A1—0 to 3 inches, dark grayish-brown (10YR 4/2) fine sandy loam; moderate, medium, granular structure; very friable; many medium and coarse roots; few fine mica flakes; very strongly acid, pH 4.8; abrupt, smooth boundary.

A2—3 to 7 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; moderate, medium, granular structure; very friable; many medium and fine roots; few fine mica flakes; very strongly acid, pH 4.7; abrupt, smooth boundary.

B2t—7 to 19 inches, yellowish-red (5YR 4/6) heavy sandy clay loam; moderate, medium, angular blocky and subangular blocky structure; friable; thin clay films; many fine roots; common fine mica flakes; very strongly acid, pH 4.7; clear, smooth boundary.

B3t—19 to 28 inches, yellowish-red (5YR 5/6) heavy sandy clay loam; moderate, medium, angular blocky and subangular blocky structure; friable; thin clay films; many fine roots; common fine mica flakes; few small grains of quartz; very strongly acid, pH 4.7; gradual, smooth boundary.

C—28 to 48 inches, reddish-yellow (7.5YR 6/6), weathered, micaceous rock that crushes to fine sandy loam; very strongly acid, pH 4.5.

Mica flakes are few to many throughout these soils. The A1 horizon is light brownish gray, grayish brown, dark brown, or dark grayish brown in color and ranges from 1 to 4 inches in thickness. The A2 horizon is pale brown or brown to dark yellowish brown and ranges from 3 to 6 inches in thickness. In plowed areas, the Ap horizon is grayish-brown, brown, yellowish-brown, or dark-brown fine sandy loam and ranges from 3 to 6 inches in thickness.

The B2t horizon ranges from 12 to 30 inches in thickness. The Bt horizon ranges from strong brown through reddish yellow to yellowish red in color and from light sandy clay loam to light clay loam in texture. The solum ranges from 20 to 40 inches in thickness. The soils are medium acid to very strongly acid in the A and B horizons and strongly acid to very strongly acid in the C horizon.

Some areas of these soils are outside the defined range for the Grover series. They have a red B2t horizon, or they lack mica flakes in the solum. These differences, however, do not affect their usefulness or behavior.

Grover soils are geographically associated with Madison, Cecil, and Hiwassee soils. They contain less clay in the subsoil than Madison, Cecil, and Hiwassee soils, and their subsoil is less reddish. They have a thinner solum than Cecil and Hiwassee soils.

Grover fine sandy loam, 15 to 25 percent slopes (GrE).—This soil has the profile described as representative of the series. It occurs on short to long slopes. The areas are irregular in shape.

Included in mapping were a few small areas where the surface layer is loam or sandy loam or is gravelly. In a few places the subsoil is heavy clay loam, and the combined thickness of the surface layer and subsoil is more than 40 inches. The included areas make up less than 10 percent of the acreage.

This soil responds to applications of lime and fertilizer. The slope makes the soil unsuited to row crops, but permanent pasture and forest are suitable uses. About 20 percent of the acreage is used for permanent pasture, and 80 percent for woodland. (Capability unit VIe–1; woodland suitability group 3r8)

Grover fine sandy loam, 2 to 6 percent slopes, eroded (GrB2).—This soil occurs on broad uplands. The areas are irregular in shape.

Erosion has removed 25 to 75 percent of the original surface layer, and the subsoil is exposed in a few places. Tillage commonly brings some of the subsoil to the surface. This soil has a surface layer of grayish-brown to brown, micaceous fine sandy loam 3 to 6 inches thick. The subsoil is yellowish-red, friable, micaceous sandy clay loam or clay loam about 26 inches thick. The lower part of the subsoil contains faint mottles of reddish yellow.

Included in mapping were a few small areas where the surface layer is gravelly sandy loam and a few small areas of Madison soils. Also included were a few small areas where the subsoil is heavy clay loam and the combined thickness of the surface layer and subsoil is more than 40 inches. The included areas make up less than 10 percent of the acreage.

Tilth is good, and the soil can be worked throughout a wide range of moisture content. Runoff is moderately rapid.

About 65 percent of the acreage is used for crops; 35 percent is in woodland. Crops respond well to applications of lime and fertilizer. (Capability unit IIe–2; woodland suitability group 3o7)

Grover fine sandy loam, 6 to 15 percent slopes, eroded (GrD2).—This soil occurs on uplands. The areas are irregular in shape.

Erosion has removed 25 to 75 percent of the original surface layer, and the subsoil is exposed in places. This micaceous soil has a surface layer of grayish-brown to brown fine sandy loam about 3 to 6 inches thick. The subsoil is yellowish-red, friable, micaceous sandy clay loam or clay loam about 18 to 24 inches thick. The lower part of the subsoil contains faint mottles of reddish yellow.

Included in mapping were a few small areas where the surface layer is gravelly sandy loam. A few small areas were included where the subsoil is clay or heavy clay loam and the combined thickness of the surface layer and subsoil is more than 40 inches. Also included were a few small

areas of Madison soils. The included areas make up less than 10 percent of the acreage.

Tilth is good, and the soil can be worked throughout a wide range of moisture content. Crops respond to applications of lime and fertilizer.

About 35 percent of the acreage is used for crops, 35 percent for permanent pasture, and 30 percent for woodland. (Capability unit IVe–1; woodland suitability group 3o7)

Grover fine sandy loam, 25 to 40 percent slopes (GrF).—This soil occurs on short to long slopes. The areas average about 40 acres in size.

This soil has a dark-brown, micaceous surface layer about 2 to 3 inches thick and a yellowish-brown subsurface layer 3 to 4 inches thick. Both layers are fine sandy loam. The subsoil is friable, micaceous light clay loam to sandy clay loam about 15 to 20 inches thick.

Included in mapping were a few small areas where the surface layer is loam, sandy loam, or gravelly sandy loam. Areas were included where the slope is outside the range for this soil. Also included were a few small areas where the subsoil is heavy clay loam and the combined thickness of the surface layer and subsoil is more than 40 inches. The included areas make up less than 12 percent of the acreage.

The slope makes this soil unsuited to cultivated crops or pasture, but the production of trees is a suitable use. Runoff is rapid. A protective cover should be maintained at all times. (Capability unit VIIe–2; woodland suitability group 3r8)

Grover fine sandy loam, 40 to 80 percent slopes (GrG).—This soil occurs on short to long side slopes. The areas are irregular in shape and average about 50 acres in size.

This soil has a dark-brown, micaceous surface layer about 2 to 3 inches thick and a yellowish-brown subsurface layer about 2 to 4 inches thick. Both layers are fine sandy loam. The subsoil is friable light clay loam to sandy clay loam, about 18 inches thick, and ranges from strong brown through reddish yellow to yellowish red in color.

Included in mapping were a few small areas where the surface layer is loam, sandy loam, or gravelly sandy loam. A few areas were included where the slope is outside the range for this soil. Also included were a few small areas where the subsoil is heavy clay loam and the combined thickness of the surface layer and subsoil is more than 40 inches. The included areas make up less than 10 percent of the acreage.

The slope makes this soil unsuited to cultivated crops or pasture. The soil is fairly well suited to the production of native hardwoods and pines. Runoff is very rapid. A permanent cover should be maintained to prevent excessive soil and water loss. All of the acreage is in native hardwoods. (Capability unit VIIe–2; woodland suitability group 3r9)

Gwinnett Series

The Gwinnett series consists of moderately deep, well-drained soils that formed in material weathered from hornblende gneiss, diorite, schist, and mixtures of acid crystalline rocks. These soils occur inextensively throughout the southern and central parts of the county. They are steep and very steep and occupy long side slopes. The slope ranges from 25 to 60 percent but is mostly 30 to 35 percent. In areas adjacent to the major streams, the slopes are shorter and steeper.

In a representative profile the surface layer is dark reddish-brown sandy loam about 6 inches thick. The subsoil is dark-red, firm clay loam and clay. Reddish-brown, partly weathered rock begins at a depth of about 30 inches.

Fertility is moderate, and the organic-matter content is medium. Infiltration and permeability are moderate. The available water capacity is medium.

These soils are too steep for cultivation. They are used for broadleaf and needleleaf trees.

Representative profile of Gwinnett sandy loam, 25 to 40 percent slopes, in a forested area on South Carolina Highway 133, 2 miles north of Calhoun railroad station and a quarter of a mile south of the bridge on Hartwell Reservoir on Twelvemile Creek:

O1—1 inch to 0, partly decomposed forest litter.

Ap—0 to 6 inches, dark reddish-brown (2.5YR 3/1) sandy loam; moderate, medium, granular structure; very friable; many fine roots and a few large roots; many pores; strongly acid, pH 5.1; abrupt, smooth boundary.

B21t—6 to 9 inches, dark-red (2.5YR 3/6) clay loam; moderate, medium and coarse, subangular blocky structure; friable; many fine roots; many small pores; few, thin, discontinuous clay films; strongly acid, pH 5.2; clear, smooth boundary.

B22t—9 to 20 inches, dark-red (2.5YR 3/6) clay; moderate, medium, angular blocky and subangular blocky structure; firm, slightly sticky and plastic; many fine roots; many small pores; continuous clay films; some small fragments of partly decomposed hornblende gneiss; strongly acid, pH 5.5; clear, wavy boundary.

B3t—20 to 30 inches, dark-red (2.5YR 3/6) clay loam; weak, medium, angular blocky structure; firm; discontinuous clay films; many partly weathered rock fragments; strongly acid, pH 5.4; diffuse, wavy boundary.

C—30 to 42 inches, reddish-brown, partly weathered rock material; structureless.

The solum ranges from 20 to 40 inches in thickness. The A horizon ranges from 4 to 8 inches in thickness, and the B2t horizon from 12 to 30 inches. The texture of the Bt horizon is clay or clay loam, and the consistence is firm to friable. The C horizon contains many fragments of hard rock. The depth to fractured rock ranges from 30 to 48 inches. Tongues of soil material extend downward into crevices in the rocks. These soils are medium acid to strongly acid throughout.

Gwinnett soils adjoin Pacolet, Hiwassee, and Madison soils. They have a darker red Bt horizon than Pacolet soils, and they contain less mica throughout than Madison soils. They are shallower than Hiwassee soils.

Gwinnett sandy loam, 25 to 40 percent slopes (GwF).—This soil has the profile described as representative of the series. It occurs on short to long side slopes. The areas are about 20 to 200 acres in size, and they are irregular in shape.

Included in mapping were a few small areas where the surface layer is gravelly sandy loam and a few areas where rocks are on the surface. Also included were a few small areas where the combined thickness of the surface layer and subsoil is outside the range for this soil. In only a few places, the subsoil is red or contains many mica flakes. The included areas make up less than 8 percent of the acreage.

The slope makes this soil unsuitable for crops or pasture. The production of trees is a suitable use. (Capability unit VIIe–1; woodland suitability group 3r8)

Gwinnett sandy loam, 40 to 60 percent slopes (GwG).—This soil occurs on short side slopes. The areas are small, and they are irregular in shape.

Included in mapping were a few small areas where the soil is thicker or thinner than the soil described as representative. Also included were a few small areas where the surface layer is gravelly sandy loam and a few areas where rocks are on the surface. In addition, a few small areas that have a red, micaceous subsoil were included. The included areas make up less than 10 percent of the acreage.

The slope makes this soil unsuitable for crops or pasture, but it is suited to trees. (Capability unit VIIe–1; woodland suitability group 3r9)

Hayesville Series

The Hayesville series consists of well-drained soils that are moderately deep over saprolite. These soils are on smooth ridgetops and in rough mountainous terrain. They formed in material weathered from granite and gneiss. These soils occur in the northern and northwestern parts of the county at elevations ranging from 1,400 to about 3,500 feet. The areas are irregular in shape and as much as 500 acres in size.

In a representative profile the surface layer is dark grayish-brown fine sandy loam about 2 inches thick. The subsurface layer is dark yellowish-brown fine sandy loam about 5 inches thick. The subsoil is red and yellowish-red, friable sandy clay loam and clay loam about 27 inches thick. Light yellowish-brown and dark grayish-brown weathered rock begins at a depth of about 34 inches.

Fertility is moderate, and the organic-matter content is medium. The available water capacity is medium. Infiltration is moderately rapid, and permeability is moderate.

The original vegetation was predominantly mixed hardwoods, but included some white pines on the higher lying areas and some shortleaf pines on the lower areas. All the acreage is now in woodland.

Representative profile of Hayesville fine sandy loam, 15 to 40 percent slopes, under a cover of hardwoods, 3 miles northwest of Rocky Bottom, in the area of the headwaters of Laurel Fork Creek.

O1—2½ inches to ½ inch, loose leaves and organic matter, mostly undecomposed.

O2—½ inch to 0, matted organic matter, partly decomposed.

A1—0 to 2 inches, dark grayish-brown (10YR 4/2), fine sandy loam; weak, medium, granular structure; very friable; many fine roots; many large pores; a few angular pebbles of quartz, 5 to 20 millimeters in length; few fine mica flakes; strongly acid, pH 5.2; abrupt, smooth boundary.

A2—2 to 7 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; weak, medium, granular structure; very friable; many fine roots; many large pores; few fine mica flakes; many fine grains of quartz; a few angular pebbles of quartz, 5 to 15 millimeters in length; very strongly acid, pH 4.8; clear, smooth boundary.

B21t—7 to 12 inches, yellowish-red (5YR 5/6) heavy sandy clay loam; weak, medium to coarse, angular blocky structure; friable; many fine roots and a few coarse roots; thin, continuous clay films; few fine mica flakes; a few fine grains of quartz; few, small, weathered, relict rock minerals; very strongly acid, pH 4.9; clear, smooth boundary.

B22t—12 to 26 inches, red (2.5YR 5/6) clay loam; weak, medium, subangular blocky and angular blocky structure; friable; few fine and medium roots; many fine pores and a few large pores; continuous clay films; few fine mica flakes; a few fine grains of quartz; few, small, weathered, relict rock materials, about 5 to 10 millimeters in length; strongly acid, pH 5.2; clear, smooth boundary.

B3t—26 to 34 inches, yellowish-red (5 YR 5/6) heavy sandy clay loam; weak, medium to coarse, subangular blocky to angular blocky structure; friable; few fine roots; thin, continuous clay films; very few fine mica flakes; many fine and medium pores; many relict, deeply weathered, small fragments of rock; very strongly acid; diffuse, wavy boundary.

C—34 to 60 inches, light yellowish-brown and dark grayish-brown weathered rock that crushes to sandy loam; massive; weathered granitic rock material; very strongly acid.

The solum ranges from 20 to 40 inches in thickness. The A1 horizon ranges from dark grayish brown to very dark grayish brown in color and from 2 to 3 inches in thickness. The A2 horizon is dark yellowish brown, dark brown, brownish yellow, or brown and ranges from 2 to 6 inches in thickness. In places the A1 and A2 horizons have been mixed to form a brown, dark-brown, or dark yellowish-brown Ap horizon 5 to 8 inches thick. The B1 horizon, where present, is yellowish-red sandy clay loam 2 to 6 inches thick. The B2t horizon ranges from sandy clay loam to clay in texture and from 14 to 22 inches in thickness. The B3t horizon ranges from 7 to 11 inches in thickness. It is commonly heavy sandy clay loam in texture but ranges to clay loam. The B3t horizon ranges from red to yellowish red in color. It commonly contains a few fragments of weathered rock. These soils are strongly acid to very strongly acid throughout.

Hayesville soils commonly adjoin Edneyville, Saluda, and, to a lesser extent, Porters soils. They have a redder Bt horizon than those soils.

Hayesville fine sandy loam, 15 to 40 percent slopes (HeF).—This soil has the profile described as representative of the series. It occurs on long side slopes. The areas range from 25 to 100 acres in size.

Included in mapping were a few small areas where the surface layer is loam, sandy loam, or gravelly sandy loam. A few areas were included where the slope is outside the range for this soil. Also included were a few small areas of Edneyville, Saluda, and Porters soils. The included areas make up less than 8 percent of the acreage.

The slope makes this soil unsuitable for crops or pasture. It is well suited to broadleaf and needleleaf trees. (Capability unit VIIe–2; woodland suitability group 2r8)

Hayesville fine sandy loam, 40 to 80 percent slopes (HeG).—The areas of this soil are irregular in shape and are about 30 to 500 acres in size. Included in mapping were a few small areas where the surface layer is sandy loam, loam, or gravelly sandy loam. A few areas were included where the slope is outside the range for this soil. A few small areas where the soil is shallow and the subsoil is less than 14 inches thick were included. Also included were a few small areas of Edneyville, Saluda, and Porters soils. The included areas make up less than 8 percent of the acreage.

Runoff is rapid. The slope makes this soil unsuitable for crops or pasture. Woodland is a suitable use. All the acreage is in second-growth broadleaf and needleleaf trees. (Capability unit VIIe–2; woodland suitability group 2r9)

Helena Series

The Helena series consists of moderately well drained soils that are moderately deep or deep to saprolite. These soils developed in material weathered from acidic and basic

crystalline rock, such as aplitic granite and mixtures of gabbro and diorite. They occur in the southern part of the county, mostly in slight depressions and as gently sloping areas on side slopes and toe slopes.

In a representative profile the surface layer is brown sandy loam about 6 inches thick. The subsoil is reddish-yellow sandy clay loam overlying light yellowish-brown firm clay. Weathered granite and basic rocks begin at a depth of about 33 inches.

These soils have a favorable moisture content throughout the growing season because of their topographic location. Fertility is moderate, and the organic-matter content is medium. Infiltration is moderate, and permeability is moderately slow. The available water capacity is medium.

Representative profile of Helena sandy loam, 2 to 6 percent slopes, in a pasture, about 3 miles southeast of Easley city limits, 30 feet east of South Carolina Highway 133, and 1,000 feet southwest of intersection of South Carolina Highways 133 and 28:

Ap—0 to 6 inches, dusky-red (10R3/4) sandy loam; moderate, medium, granular structure; very friable; many fine and medium roots; medium acid, pH 5.6; abrupt, smooth boundary.

B21t—6 to 11 inches, reddish-yellow (7.5YR 6/6) sandy clay loam; few, fine, faint mottles of light yellowish brown; moderate, medium, subangular blocky structure; firm; continuous clay films; many fine roots; strongly acid, pH 5.3; clear, smooth boundary.

B22t—11 to 23 inches, light yellowish-brown (10YR 6/4) clay; many, fine and medium, distinct mottles of red (10R 4/6); many, fine, faint mottles of light brown; few, fine, distinct mottles of light gray; moderate, medium and coarse, subangular blocky and angular blocky structure; firm, sticky and somewhat plastic; continuous clay films; few fine roots; strongly acid; pH 5.3; gradual, wavy boundary.

B23t—23 to 33 inches, light yellowish-brown (10YR 6/4) clay; many, medium and fine, distinct mottles of red (10R 4/6) and light gray (10YR 7/2); moderate, medium and coarse, angular blocky and subangular blocky structure; firm, sticky and somewhat plastic; continuous clay films; very few fine roots; strongly acid, pH 5.4; diffuse, wavy boundary.

C—33 to 48 inches, weathered granitic and basic rocks that contain about equal parts of light yellowish brown, gray, and red; reticulate mottling; massive; firm; very strongly acid, pH 4.7.

The solum ranges from 30 to 60 inches in thickness. The A horizon is brown, dark brown, or pale olive and ranges from 5 to 18 inches in thickness. The B2t horizon is reddish yellow, light yellowish brown, yellowish brown, brownish yellow, or strong brown mottled with red, light gray, and light brownish gray. The B2t horizon is sandy clay loam or clay loam in the upper part and sandy clay or clay in the lower part. The B3t horizon, where present, is yellowish-brown to very pale brown sandy clay loam to clay loam mottled with yellowish red to light brownish gray. Except where limed, the soils are strongly acid to very strongly acid throughout.

Helena soils commonly adjoin Cecil, Madison, and Grover soils. They are less well drained than those soils.

Helena sandy loam, 2 to 6 percent slopes (HlB).—This soil has the profile described as representative of the series. It occurs inextensively. The areas are small and irregular in shape. Included in mapping were a few small areas where the slope is outside the range for this series. The included areas make up less than 3 percent of the acreage.

Tilth is good, and the soil can be cultivated throughout a wide range of moisture content. This soil is easy to manage and responds to applications of lime and fertilizer. Because it commonly occupies the toe slopes and foot slopes, the soil receives adequate moisture for most crops. (Capability unit IIe–3; woodland suitability group 3w8)

Hiwassee Series

The Hiwassee series consists of deep, well-drained soils that formed in saprolite or old alluvium. These soils are in the broad upland areas on long side slopes. The slope ranges from 2 to 25 percent. These soils occur mainly in the central and southern parts of the county.

In a representative profile the surface layer is dusky-red sandy loam about 6 inches thick. The subsoil is dark-red, friable sandy clay loam in the upper part and dark-red clay overlying clay loam in the lower part. Weathered hornblende gneiss and diorite begin at a depth of about 50 inches.

The natural fertility is moderate, and the organic-matter content is medium. Infiltration and permeability are moderate. The available water capacity is medium.

These soils are used for crops, pasture, and forest. They respond well to good management.

Representative profile of Hiwassee sandy loam, 2 to 6 percent slopes, eroded, in a wooded area, 1½ miles south of city limits of Central, 30 feet east of South Carolina Highway 30, and 400 feet north of intersection of South Carolina Highways 30 and 62:

Ap—0 to 6 inches, dusky-red (10R 3/4) sandy loam; moderate, medium, granular structure; very friable; many fine roots and a few large roots; medium acid, pH 5.6; abrupt, smooth boundary.

B21t—6 to 15 inches, dark-red (10R 3/6) sandy clay loam; weak, medium, angular blocky structure; friable; thin, continuous clay films; many fine roots; many large pores; strongly acid, pH 5.4; abrupt, smooth boundary.

B22t—15 to 35 inches, dark-red (10R 3/6) clay; moderate, medium, subangular blocky structure; firm; continuous clay films; slightly sticky and plastic, hard; a few fine roots; a few very small grains of quartz; strongly acid, pH 5.3; clear, wavy boundary.

B3t—35 to 50 inches, dark-red (10R 3/6) clay loam; weak, medium, subangular blocky structure; firm; thin, discontinuous clay films; a few fine grains of quartz; few fine mica flakes; a few small roots; few small pores; strongly acid, pH 5.5; diffuse, wavy boundary.

C—50 to 60 inches, weathered hornblende gneiss and diorite rocks; massive; very strongly acid, pH 5.1.

The solum ranges from 40 to more than 60 inches in thickness. The A horizon is sandy loam that ranges from 5 to 9 inches in thickness or clay loam that ranges from 2 to 5 inches in thickness. It is dark reddish brown, dark red, or dusky red. The B1t horizon, where present, or the B21t horizon is sandy clay loam or clay loam and ranges from 3 to 10 inches in thickness. The B22t horizon is clay or heavy clay loam and ranges from 20 to 40 inches in thickness. The B3t horizon ranges from dark red to red in color, from clay loam to clay in texture, and from 10 to 30 inches in thickness. In many profiles there are common to many mica flakes in the B and C horizons, but in some profiles mica flakes are present only in the lower part of the B horizon. Except where limed, the soils are medium acid to strongly acid throughout.

Hiwassee soils commonly adjoin Cecil and Madison soils. They have a darker red subsoil than those soils.

Hiwassee sandy loam, 2 to 6 percent slopes, eroded (HwB2).—This soil has the profile described as representative of the series. It occurs on broad ridgetops and uplands. Side slopes are long. The areas of this soil are

irregular in shape. Erosion has removed 25 to 75 percent of the original surface layer, and tillage commonly brings some of the subsoil to the surface.

Included in mapping were a few small areas where the surface layer is uneroded and is 7 to 9 inches thick. A few thin spots where the surface layer is clay loam were included, as were a few small areas where the slope is outside the range for this soil. Also included were a few small areas of Cecil and Madison soils. The included areas make up less than 10 percent of the acreage.

Tilth is good, and the soil can be worked throughout a moderately wide range of moisture content. About 70 percent of the acreage is used for cultivated crops, 20 percent for pasture, and 10 percent for woodland. Crops respond to applications of lime and fertilizer. (Capability unit IIe–1; woodland suitability group 3o7)

Hiwassee sandy loam, 6 to 10 percent slopes, eroded (HwC2).—This soil occurs on broad uplands on long side slopes. Erosion has removed 25 to 75 percent of the original surface layer, and tillage commonly brings some of the subsoil to the surface.

Included in mapping were a few small areas where the slope is outside the range for this soil. Also included were a few small areas where the surface layer is uneroded and is 7 to 9 inches thick. In a few small areas the surface layer is clay loam or gravelly sandy loam. In a few places small areas of Starr soils were included. Also included were a few very small areas of Cecil and Madison soils. The included areas make up less than 8 percent of the acreage.

This soil is well suited to crops commonly grown in the area. About 75 percent of the acreage is used for crops, 10 percent for pasture, and 15 percent for woodland. Tilth is good, and this soil can be worked throughout a moderately wide range of moisture content. Crops respond to applications of lime and fertilizer. (Capability unit IIIe–1; woodland suitability group 3o7)

Hiwassee sandy loam, 10 to 25 percent slopes, eroded (HwE2).—This soil occurs on short to long side slopes. The areas are irregular in shape and about 5 to 40 acres in size.

Erosion has removed 25 to 75 percent of the original surface layer, and the subsoil is exposed in a few places. Included in mapping were a few small areas where the surface layer is loam, clay loam, or gravelly sandy loam. Also included were a few small areas where the surface layer is uneroded and is 7 to 9 inches thick. In a few places small areas of Cecil and Madison soils were included. The included areas make up less than 10 percent of the acreage.

The slope makes this soil unsuited to crops, but permanent pasture or woodland are suitable uses. Runoff is very rapid. (Capability unit VIe–1; woodland suitability group 3r8)

Hiwassee clay loam, 2 to 6 percent slopes, eroded (HyB2).—The profile of this soil is similar to that described as representative of the series, except that the surface layer is clay loam. This soil is gently sloping. It occurs on long side slopes on uplands. The areas are irregular in shape and range from 10 to 30 acres in size.

The surface layer is dark reddish-brown clay loam about 4 inches thick. Erosion has removed 75 to 100 percent of the original surface layer and, in many places, as much as 25 percent of the subsoil. Tillage operations are primarily in the subsoil.

Included in mapping were a few small areas where the surface layer is sandy loam about 3 to 6 inches thick. In a few included areas a small amount of gravel occurs in the surface layer, but it is not sufficient to interfere with cultivation. A few areas were included where the slope is outside the range for this soil. Also included in a few places were small areas of Cecil and Madison soils. The included areas made up less than 7 percent of the acreage.

Tilth is poor, and the soil is difficult to manage. It can be cultivated only within a narrow range of moisture content.

The surface layer tends to clod, and in many areas it is difficult to obtain good stands from most plantings. Runoff is rapid, and erosion is a severe hazard where the soil is cultivated. About 60 percent of the acreage is used for crops, 30 percent for pasture, and 10 percent for woodland. (Capability unit IIIe–1; woodland suitability group 4c2e)

Hiwassee clay loam, 6 to 10 percent slopes, severely eroded (HyC3).—The profile of this soil is similar to that described as representative of the series, except that the surface layer is clay loam. This soil occupies moderately long side slopes. The areas are irregular in shape and range from 5 to 40 acres in size.

The surface layer is dark reddish-brown clay loam about 4 inches thick. Erosion has removed 75 to 100 percent of the original surface layer and, in places, as much as 25 percent of the subsoil. Tillage is mainly in the subsoil.

Included in mapping were a few small areas where the surface layer is sandy loam 3 to 6 inches thick. A few areas were included where the slope is outside the range for this soil. Also included were a few small areas of Cecil and Madison soils. The included areas make up less than 7 percent of the acreage.

Tilth is poor, and the soil is difficult to manage. It can be cultivated only within a narrow range of moisture content.

Erosion is a severe hazard where this soil is cultivated. About 25 percent of the acreage is used for crops, 40 percent for pasture, and 35 percent for woodland. (Capability unit IVe–1; woodland suitability group 4c2e)

Hiwassee clay loam, 10 to 25 percent slopes, severely eroded (HyE3).—The profile of this soil is similar to that described as representative of the series, except that the surface layer is clay loam. This soil occurs in steep upland areas on short to long side slopes. The areas are irregular in shape and range from 5 to 40 acres in size.

This soil has a plow layer of dark reddish-brown clay loam about 4 inches thick. Erosion has removed 75 to 100 percent of the original surface layer and, in many places, as much as 25 percent of the subsoil. The subsoil is a dark-red, firm clay to clay loam about 42 to 50 inches thick.

Included in mapping were small areas where the surface layer is sandy clay loam, gravelly clay loam, or sandy loam. Also included were areas where the surface layer is reddish brown. In a few areas, the slope is outside the slope range for this soil. A few small areas of Cecil, Madison, and Gwinnett soils were included. The included areas make up less than 10 percent of the acreage.

This soil is not suited to crops, but permanent pasture and woodland are suitable uses. (Capability unit VIe–1; woodland suitability group 4c3e)

Louisburg Series

The Louisburg series consists of shallow, excessively drained soils overlying weathered rock. These soils developed in residuum weathered from granite and granite gneiss. They occur in a few small areas throughout the central and southern parts of the county.

In a representative profile the surface layer is dark-gray sandy loam about 2 inches thick. The subsurface layer is light olive-brown sandy loam about 3 inches thick. The subsoil is yellowish-brown sandy loam. Yellowish-brown sandy loam and weathered granite and gneiss begin at a depth of about 13 inches.

Fertility and the organic-matter content are low. Water enters the soil at a moderately rapid rate, and permeability is moderately rapid. Mineral nutrients commonly leach out of the surface layer very rapidly. The available water capacity is low.

Most of the acreage is in mixed broadleaf and needleleaf forest.

Representative profile of Louisburg sandy loam, 10 to 25 percent slopes, in an area of hardwoods, 1½ miles northwest of railroad station at Clemson University, in the southwestern part of the county:

O1—2 inches to ½ inch, loose leaves and organic matter, largely undecomposed.
O2—½ inch to 0, matted organic matter, partly decomposed.
A1—0 to 2 inches, dark gray (10YR 4/1) sandy loam; weak, fine, granular structure; very friable; many fine and medium roots; many large pores; very strongly acid; clear, smooth boundary.
A2—2 to 5 inches, light olive-brown (2.5Y 5/4) sandy loam; weak, medium, granular structure; very friable; many fine roots; many large pores; very strongly acid; clear, smooth boundary.
B—5 to 13 inches, yellowish-brown (10YR 5/4) sandy loam; weak, medium, granular structure; friable; many medium and fine roots; many large pores; very strongly acid; gradual, wavy boundary.
C—13 to 27 inches, yellowish-brown (10YR 5/6 and 10YR 5/8) sandy loam; weathered granite and granite gneiss; a few fine mica flakes; massive; very strongly acid.

The combined thickness of the A and B horizons ranges from 10 to 20 inches. The depth to bedrock ranges from 2 to 10 feet. The Ap horizon, where present, is dark gray, grayish brown, dark grayish brown, brown, or light olive brown in color and ranges from 5 to 10 inches in thickness. The B horizon is yellowish brown, brownish yellow, strong brown, or reddish yellow and ranges from 5 to 10 inches in thickness. The C horizon is yellowish-brown, yellowish-red, brown, gray, or grayish-brown saprolite that ranges from sandy loam to loamy coarse sand in texture. The C horizon ranges from a few inches to several feet in thickness. These soils are strongly acid to very strongly acid throughout.

These soils are outside the defined range of the Louisburg series. They lack continuous or recurring horizons that contain an increasing amount of clay as depth increases. This difference, however, does not alter their usefulness and behavior.

Louisburg soils commonly adjoin Cecil and Pacolet soils. They have a thinner solum than those soils, and they lack the B1 horizon.

Louisburg sandy loam, 10 to 25 percent slopes (LoE).—This soil has the profile described as representative of the series. It occurs on ridgetops and short side slopes. The areas are irregular in shape; they range from 5 to about 30 acres in size.

Included in mapping were a few small areas of Pacolet soils. Also included were a few areas where the slope is outside the range for this soil. In addition, a few areas where small boulders are on the surface were included. The included areas make up less than 7 percent of the acreage.

The slope makes this soil unsuited to cultivated crops or pasture, but woodland is a suitable use. All the acreage is in woodland. (Capability unit VIIe–2; woodland suitability group 3r8)

Louisburg sandy loam, 25 to 40 percent slopes (LoF).—This soil occurs on side slopes. The areas are small and widely scattered.

Included in mapping were a few small areas of Pacolet soils. Also included were a few areas where the soil has a thin, discontinuous layer of clay accumulation. A few areas were included where the slope is outside the range for this soil. In a few included areas small boulders are on the surface. The included areas make up less than 7 percent of the acreage.

The slope makes this soil poorly suited to cultivated crops or pasture, but growing trees is a suitable use. All the acreage is in woodland. (Capability unit VIIe–2; woodland suitability group 3r8)

Madison Series

The Madison series consists of moderately deep to deep, well-drained, micaceous soils that formed in residuum weathered from quartz mica schist and, in places, from micaceous gneiss. These soils occur at elevations ranging from 700 to 1,400 feet throughout the Piedmont area of the county. The areas are irregular in shape, and most are 10 to 200 acres in size. The slope ranges from 2 to 25 percent, but in most places it is 7 to 12 percent.

In a representative profile the surface layer is yellowish-red sandy loam about 5 inches thick. The subsoil is red, micaceous clay loam and clay. Deeply weathered, yellowish-red to reddish-yellow sandy loam saprolite begins at a depth of about 42 inches.

The natural fertility and the organic-matter content are low. Infiltration and permeability are moderate, and the available water capacity is medium. The root zone is deep.

The native vegetation is oak, hickory, and some pine trees and an understory of vines, briers, shrubs, and native grasses. Most of the acreage has been cultivated, except where the soil is moderately steep. On slopes of less than 10 percent, all the commonly grown crops are well suited. Crops respond to liberal applications of lime and fertilizer.

Representative profile of Madison sandy loam, 2 to 6 percent slopes, eroded, in a cultivated field, 1 mile south of Woodall Mountain fire tower, immediately west of paved road:

Ap—0 to 5 inches, yellowish-red (5YR 4/6) sandy loam; moderate, medium, granular structure; very friable; many fine roots; many medium pores; a few, small, angular fragments of quartz, 10 to 25 millimeters in diameter; few small concretions, 7 millimeters in size; few, small, platy fragments of quartz mica schist; few fine mica flakes; few fine quartz grains; slightly acid, pH 6.3; abrupt, smooth boundary.
B21t—5 to 9 inches, red (2.5YR 4/6) clay loam; weak, medium, subangular blocky structure; friable; many fine roots; many fine pores; thin clay films; common fine mica flakes; strongly acid, pH 5.4; clear, smooth boundary.

B22t—9 to 32 inches, red (2.5YR 4/8) clay; moderate, medium, subangular blocky structure; friable; few fine roots; few small pores; thin, continuous clay films; many fine mica flakes; strongly acid, pH 5.3; clear, wavy boundary.

B3t—32 to 42 inches, red (2.5YR 4/6) clay loam; weak, medium and coarse, subangular blocky structure; friable; thin, patchy clay films; few fine pores; many fine mica flakes; few coarse quartz grains; strongly acid, pH 5.2; clear, wavy boundary.

C—42 to 48 inches, deeply weathered, yellowish-red to reddish-yellow sandy loam saprolite from quartz mica schist; friable; many medium and fine mica flakes; strongly acid, pH 5.3; massive.

The solum ranges from 30 to 45 inches in thickness. The Ap horizon ranges from grayish brown to yellowish red in color in eroded areas and from yellowish red to red in severely eroded areas. The texture is dominantly sandy loam in eroded areas and clay loam in severely eroded areas. The B horizon ranges from red to dark red in color, from clay loam to clay in texture, and from 22 to 38 inches in thickness. It is friable to firm and has weak to moderate, blocky structure. The C horizon is saprolite weathered from mica schist or mica gneiss. When crushed, the C horizon is sandy loam, sandy clay loam, or loam. Except where limed, the soils are strongly acid throughout.

Madison soils commonly adjoin Hiwassee and Cecil soils. They contain more mica than those soils.

Madison sandy loam, 2 to 6 percent slopes, eroded (MaB2).—This soil has the profile described as representative of the series. It occurs on broad ridges and long slopes. The areas are irregular in shape and average 10 to 50 acres in size.

Included in mapping were a few small areas where the surface layer is uneroded and 7 to 10 inches thick. Also included were a few small areas where the surface layer is severely eroded clay loam about 3 inches thick. In addition, there are a few small, gravelly areas. The included areas make up less than 5 percent of the acreage.

This soil can be tilled throughout a wide range of moisture content.

Most of this soil has been used extensively for crops. About 80 percent is used for crops, 15 percent for pasture, and 5 percent for woodland. (Capability unit IIe–1; woodland suitability group 3o7)

Madison sandy loam, 6 to 10 percent slopes, eroded (MaC2).—This soil occurs on broad uplands and short slopes. The areas are irregular in shape and 15 to 100 acres in size. Included in mapping were a few small areas where the surface layer is uneroded sandy loam 7 to 8 inches thick. Also included were a few small severely eroded areas where the surface layer is clay loam. Also included were a a few areas where the slope is outside the range for this soil. These included areas make up less than 5 percent of the acreage.

Tilth is good, and the soil can be tilled throughout a wide range of moisture content. Runoff is medium.

Nearly all of this soil has been cultivated or used for pasture. About 75 percent of the acreage is used for crops, 15 percent for pasture, and 10 percent for woodland. (Capability unit IIIe–1; woodland suitability group 3o7)

Madison sandy loam, 10 to 25 percent slopes, eroded (MaE2).—This soil occurs on short to long slopes. The areas are irregular in shape and average about 25 acres in size. Included in mapping were a few small areas where the surface layer is clay loam or sandy clay loam. Also included were a few small areas where the surface layer is uneroded and is 7 to 8 inches thick. In addition, a few areas were included where the slope is outside the range for this soil. Also, a few small areas of Cecil soils were included. The included areas make up less than 10 percent of the acreage.

Tilth is good, but the slope makes the soil unsuited to crops. Permanent pasture and woodland are suitable uses. Runoff is rapid. (Capability unit VIe–1; woodland suitability group 3r8)

Madison clay loam, 10 to 25 percent slopes, severely eroded (McE3).—This soil is strongly sloping to moderately steep and occurs on short slopes. Areas are irregular in shape and about 30 acres in size.

This soil has a surface layer of yellowish-red clay loam about 3 inches thick. The subsoil is red, friable clay and clay loam about 32 inches thick. Erosion has removed 75 percent to 100 percent of the original surface layer and, in places, as much as 25 percent of the subsoil. Rills are numerous, and there are a few shallow gullies in places.

Included in mapping were a few small areas where the surface layer is sandy loam, gravelly sandy loam, gravelly clay loam, and clay. A few areas were included where the slope is outside the range for this soil. Also included were a few small areas of severely eroded Cecil soils. The included areas make up less than 10 percent of the acreage.

Runoff is very rapid. Tilth is poor, and the soil is difficult to manage.

This soil is not suited to crops or pasture but is fairly well suited to forestry. About 10 percent of the acreage is used for cultivated crops, and 90 percent for forest. (Capability unit VIIe–1; woodland suitability group 4c3e)

Musella Series

The Musella series consists of shallow, well-drained soils that formed in residuum weathered from hornblende gneiss and diorite. These soils occur in the Piedmont area of the county. They are very steep and occupy short slopes in a few widely scattered areas. The areas are irregular in shape and range from 5 to 50 acres in size.

In a representative profile the surface layer is dark-brown loam about 3 inches thick. The subsurface layer is dark reddish-brown silt loam about 3 inches thick. The subsoil is dark-red clay loam. The depth to broken rock is about 17 inches.

The natural fertility and the organic-matter content are low. Infiltration and permeability are moderate, and the available water capacity is low. These soils have a shallow root zone.

The native vegetation was oak, hickory, and Virginia pine and an understory of shrubs, vines, and briers. Most of the acreage is now in mixed hardwoods and pines, but some areas are in pure stands of Virginia pine.

Representative profile from an area of Musella soils, 40 to 80 percent slopes, in a hardwood forest area, 1¾ miles east of the confluence of Eastatoe Creek and Little Eastatoe Creek:

O1—1½ inches to ½ inch, loose leaves and organic debris, undecomposed.

O2—½ inch to 0, matted organic matter, partly decomposed.

A1—0 to 3 inches, dark-brown (7.5YR 3/3) loam; weak, medium, granular structure; very friable; many roots; many large pores; a few small fragments of hornblende gneiss; slightly acid, pH 6.1; abrupt, smooth boundary.

A3—3 to 6 inches, dark reddish-brown (5YR 3/3) silt loam; weak, medium, granular structure; very friable; many roots; many fine and medium pores; a few small fragments of hornblende gneiss; strongly acid, pH 5.3; clear, smooth boundary.

Bt—6 to 17 inches, dark-red (2.5YR 3/6) clay loam; moderate, medium, subangular and angular blocky structure; firm; continuous, thick clay films; few small and medium root holes; few small pores; a few small fragments of partly weathered hornblende gneiss; strongly acid, pH 5.3; gradual, wavy boundary.

C—17 to 20 inches, slightly weathered, relatively hard rock, mainly hornblende gneiss and diorite; material in cracks is sandy loam.

The solum ranges from 12 to 20 inches in thickness. The A horizon is loam, clay loam, or fine sandy loam and ranges from dark reddish brown to dark brown in color and from 2 to 8 inches in thickness. Some areas are gravelly or stony. The Bt horizon ranges from clay to clay loam in texture and from 10 to 15 inches in thickness. Some fragments of partly weathered hornblende gneiss generally occur throughout the profile. The A horizon is slightly acid to strongly acid, and the B and C horizons are medium acid to strongly acid.

These soils are outside the defined range for this series; they lack the high content of fragments in the solum, and they contain slightly more clay in the Bt horizon than is representative. These differences, however, do not alter their usefulness and behavior.

Musella soils commonly adjoin Gwinnett and Hiwassee soils. They are shallower than those soils.

Musella soils, 40 to 80 percent slopes (MuG).—These are shallow soils. The areas are irregular in shape and about 10 acres in size.

Included in mapping were small areas where the slope is outside the range for these soils. Also included were a few small areas of Gwinnett soils where the combined thickness of the surface layer and subsoil ranges from 20 to 40 inches and a few small areas of Hiwassee soils where the combined thickness of the surface layer and subsoil is more than 40 inches. The included areas make up less than 7 percent of the acreage.

Runoff is very rapid. These soils are suited to trees. An adequate forest cover should be maintained at all times to protect the soils from erosion. (Capability unit VIIe–1; woodland suitability group 3r9)

Pacolet Series

The Pacolet series consists of moderately deep to deep, well-drained soils that formed in material weathered from granite and gneiss. These soils occur throughout the Piedmont area of the county at elevations ranging from 700 to 1,400 feet.

In a representative profile the surface layer is brown fine sandy loam about 6 inches thick. The subsoil is yellowish-red sandy clay loam overlying firm, red clay and clay loam. It is about 26 inches thick. Weathered granite and gneiss that crush to sandy loam begin at a depth of about 32 inches.

The natural fertility and the organic-matter content are low. Infiltration and permeability are moderate, and the available water capacity is medium to low. The root zone is moderately deep.

The native vegetation is oak, hickory, and pine and an understory of vines, shrubs, and native grasses. Most of the acreage has been cultivated, except where the slope is more than 15 percent. All commonly grown crops are well suited. Crops respond to liberal applications of lime and fertilizer.

Representative profile of Pacolet fine sandy loam, 6 to 10 percent slopes, eroded, 2 miles northwest of Dacusville, a quarter of a mile northwest of Shoal Creek:

Ap—0 to 6 inches, brown (7.5YR 4/4) fine sandy loam; moderate, medium, granular structure; very friable; many fine and medium roots; many large pores; few small fragments of quartz; strongly acid, pH 5.3; abrupt, smooth boundary.

B1t—6 to 8 inches, yellowish-red (5YR 4/6) heavy sandy clay loam; moderate, medium, angular blocky structure; friable; many roots; many medium pores; thin, continuous clay films; strongly acid, pH 5.1; clear, smooth boundary.

B2t—8 to 24 inches, red (10R 4/6) clay; moderate, medium, subangular blocky structure; firm; few fine roots; moderately thick clay films; few small grains of quartz; few fine mica flakes; strongly acid, pH 5.3; diffuse, wavy boundary.

B3t—24 to 32 inches, red (10R 4/6) clay loam; moderate, medium, subangular blocky structure; firm; very few fine roots; few small pores; continuous clay films; few fine mica flakes; strongly acid, pH 5.4; diffuse, wavy boundary.

C—32 to 40 inches +, weathered granite and gneiss rock that crushes to sandy loam; massive; few fine mica flakes; strongly acid, pH 5.3.

The solum ranges from 25 to 38 inches in thickness. Where the soils formed under hardwood forest, the A1 horizon commonly ranges from 1 to 3 inches in thickness and from brown to very dark grayish brown in color. The A2 horizon, where present, ranges from 3 to 9 inches in thickness and is yellowish brown, reddish yellow, or dark grayish brown to brown in color. In eroded areas the surface layer is brown, grayish-brown, or yellowish-red fine sandy loam. In severely eroded areas the surface layer is clay loam that ranges from yellowish red to red in color.

The B1 horizon ranges from 2 to 6 inches in thickness, from sandy clay loam to clay loam in texture, and from yellowish red to red in color. The B2t horizon ranges from about 10 to 18 inches in thickness. The texture commonly is clay, but in places it is clay loam or sandy clay. The B3t horizon ranges from sandy clay loam to clay loam in texture, from yellowish red to red in color, and from 4 to 14 inches in thickness. The C horizon is brown, red, and gray mottled saprolite that is sandy loam or sandy clay loam in texture. Except where limed, the soils are strongly acid to very strongly acid throughout.

Pacolet soils commonly adjoin Cecil, Grover, and Madison soils. They are shallower than Cecil soils, and they contain less mica than Grover and Madison soils.

Pacolet fine sandy loam, 2 to 6 percent slopes, eroded (PaB2).—This soil occurs on uplands on long side slopes. The areas are somewhat oval in shape and about 10 to 50 acres in size.

Erosion has removed 25 to 75 percent of the original surface layer. Tillage commonly brings some of the subsoil to the surface.

Included in mapping were a few small areas where the surface layer is uneroded and 7 to 9 inches thick. In a few places the slope is outside the range for this soil. Also included were a few small areas of Cecil, Madison, and Grover soils. The included areas make up less than 12 percent of the acreage.

Tilth is good, and the soil can be tilled throughout a wide range of moisture content. Runoff is moderate.

This soil is well suited to all the commonly grown crops. About 65 percent of the acreage is used for crops, 10 percent for pasture, and 25 percent for woodland. (Capability unit IIe–1; woodland suitability group 3o7)

Pacolet fine sandy loam, 6 to 10 percent slopes, eroded (PaC2).—This soil has the profile described as representative of the series. It occurs on broad ridgetops

and uplands on moderately long side slopes. The areas are somewhat oval in shape and about 20 to 30 acres in size.

Erosion has removed 25 to 75 percent of the original surface layer. Tillage commonly brings some of the subsoil to the surface.

Included in mapping were a few small areas where the surface layer is uneroded and 7 to 9 inches thick. In a few places the surface layer is gravelly fine sandy loam. A few areas where the slope is outside the range for this soil were included. Also included were a few small areas of Cecil, Grover, and Madison soils. The included areas make up less than 12 percent of the acreage.

Tilth is good, and the soil can be tilled throughout a wide range of moisture content. Runoff is moderately rapid.

This soil is well suited to all the commonly grown crops. About 45 percent of the acreage is used for crops, 20 percent for pasture, and 35 percent for woodland. Crops respond to applications of lime and fertilizer. (Capability unit IIIe–1; woodland suitability group 3o7)

Pacolet fine sandy loam, 10 to 25 percent slopes, eroded (PaE2).—This soil occurs as somewhat elongated areas, on short to long side slopes. The areas are about 50 acres in size.

Erosion has removed 25 to 75 percent of the original surface layer. A few rills and shallow gullies occur in places.

Included in mapping were a few small areas where the surface layer is uneroded and 7 to 9 inches thick. In a few included areas, the surface layer is stony or gravelly fine sandy loam. A few small areas of Cecil, Grover, and Madison soils were included. In a few areas the slope is outside the range for this soil. The included areas make up less than 15 percent of the acreage.

Rapid runoff and the slope make this soil unsuited to crops, but pasture and woodland are suitable uses. About 90 percent of the acreage is used for woodland; most of the rest is used for pasture. (Capability unit VIe–1; woodland suitability group 3r8)

Pacolet fine sandy loam, 25 to 40 percent slopes (PaF).—This soil occurs on short to long side slopes. The areas are elongated, and they roughly parallel the major streams. They are about 20 to 200 acres in size.

Included in mapping were a few small areas where the surface layer is stony fine sandy loam. A few areas were included where the slope is outside the range for this soil. Also included were a few small areas of Grover and Madison soils. The included areas make up less than 8 percent of the acreage.

Because of the slope and excessive runoff, this soil is unsuited to cultivation or pasture, but it is well suited to woodland. About 7 percent of the acreage is used for pasture, and 93 percent for woodland. (Capability unit VIIe–1; woodland suitability group 3r8)

Pacolet fine sandy loam, 40 to 80 percent slopes (PaG).—This soil occurs on short to long side slopes. The areas are irregular in shape, and they parallel the major streams. They are about 30 to 500 acres in size.

Included in mapping were a few small areas where the slope is outside the range for this soil. A few small stony areas were included. Also included were a few small areas of Grover and Madison soils. The included areas make up about 7 percent of the acreage.

This soil is unsuited to cultivation because of the slope, but it is suited to woodland. All the acreage is in native hardwoods. (Capability unit VIIe–1; woodland suitability group 3r9)

Pacolet clay loam, 2 to 10 percent slopes, severely eroded (PcC3).—This soil occurs on uplands on long side slopes. The areas are irregular in shape and about 10 to 40 acres in size.

The surface layer is yellowish-red clay loam about 5 inches thick. The subsoil is red, firm clay loam about 25 inches thick. Erosion has removed 75 to 100 percent of the original surface layer and, in places, as much as 25 percent of the subsoil. Tillage is mostly in the subsoil.

Included in mapping were a few small areas of Cecil, Grover, and Madison soils. A few areas were included where the slope is outside the range for this soil. Also included were a few areas where the surface layer is sandy loam. The included areas make up less than 7 percent of the acreage.

Tilth is poor, and the soil can be worked only within a narrow range of moisture content. It is moderately responsive to applications of lime and fertilizer. Erosion is a severe hazard where the soil is used for crops.

This soil is fairly well suited to small grains and permanent pasture. About 15 percent of the acreage is used for crops, 25 percent for pasture, and 60 percent for woodland. (Capability unit IVe–1; woodland suitability group 4c2e)

Pacolet clay loam, 10 to 25 percent slopes, severely eroded (PcE3).—This soil occurs on uplands on long side slopes. The areas are irregular in shape and about 25 acres in size.

The surface layer is yellowish-red clay loam about 5 inches thick. Erosion has removed 75 to 100 per cent of the original surface layer and, in places, as much as 25 percent of the subsoil. Tillage is commonly in the subsoil. The subsoil is red clay loam about 24 inches thick.

Included in mapping were a few small areas of Cecil, Grover, and Madison soils. In a few places the surface layer is sandy loam. The included areas make up less than 7 percent of the acreage.

Erosion is a severe hazard. This soil is suited only to trees. About 7 percent of the acreage is in pasture, and 93 percent in woodland. (Capability unit VIIe–1; woodland suitability group 4c3e)

Porters Series

The Porters series consists of well-drained soils that are moderately deep to saprolite. These soils developed in residuum weathered from dark-colored granite and gneiss. They occur in mountainous areas at elevations ranging from 1,400 to 3,500 feet. In most areas elevations are between 2,500 and 3,500 feet. The slope ranges from 15 to 70 percent but is mostly 40 to 60 percent.

In a representative profile the surface layer is black loam about 6 inches thick. The subsoil is dark-brown clay loam in the upper part and yellowish-brown light clay loam in the lower part. The subsoil is about 29 inches thick. Weathered rock that crushes to fine sandy loam begins at a depth of about 35 inches. The depth to hard rock is variable, but commonly is about 3 to 5 feet.

The natural fertility and the organic-matter content are high. Water enters the soils at a moderate rate, and permeability is moderate. The available water capacity is medium.

All the acreage is in native hardwoods. In a few places the stands include white pine.

Representative profile of Porters loam, 15 to 40 percent slopes, in a hardwood forest, 200 yards southeast of Sassafras Mountain lookout tower:

O1—2½ inches to ½ inch, loose leaves, undecomposed.
O2—½ inch to 0, matted organic matter, partly decomposed.
A1—0 to 6 inches, black (10YR 2/1) loam; moderate, medium, granular structure; very friable; many fine roots; a few fine mica flakes; many large pores; strongly acid, pH 5.5; abrupt, smooth boundary.
B2t—6 to 18 inches, dark-brown (7.5YR 4/4) clay loam; moderate, medium and coarse, angular blocky structure; friable; many fine and medium roots; many medium pores and a few large pores; few, thin, patchy clay films; few fine mica flakes; very few fine grains of quartz; a few root holes and organic stains; a few very fine, dark-colored rock minerals; strongly acid, pH 5.2; clear, smooth boundary.
B3t—18 to 35 inches, yellowish-brown (10YR 5/6) light clay loam; moderate, medium and coarse, angular and subangular blocky structure; friable; many fine and a few medium roots; few, thin, patchy clay films; many small fragments of biotite mineral; many medium and large pores; few to common fine mica flakes; strongly acid, pH 5.3; clear, smooth boundary.
C—35 to 72 inches, weathered gneissoid rock (chiefly diorite-gneiss, or epidiorite); massive; medium acid, pH 6.0; weathered materials rub out to fine sandy loam.

The solum ranges from 20 to 40 inches in thickness. The A horizon is black or very dark brown to very dark grayish brown in color and ranges from 6 to 8 inches in thickness. The B2t horizon ranges from dark brown to yellowish brown in color, from sandy clay loam to clay loam in texture, and from 8 to 16 inches in thickness. The B3t horizon is clay loam, fine sandy clay loam, or loam and ranges from 8 to 20 inches in thickness. The color of the B3t is brown, strong brown, yellowish brown, or dark yellowish brown. Few to common mica flakes occur throughout the solum. These soils are medium acid to strongly acid throughout.

Porters soils commonly adjoin Hayesville and Edneyville soils. They have a thicker surface layer than those soils.

Porters loam, 15 to 40 percent slopes (PoF).—This soil has the profile described as representative of the series. It occurs on ridgetops and long side slopes. The areas are somewhat narrow and long, roughly paralleling the drainage areas. They are 20 to 100 acres in size.

Included in mapping were a few small areas where the surface layer is fine sandy loam and a few small areas where it is gravelly sandy loam. Also included were a few small areas of Tusquitee soil. A few areas were included where the slope is outside the range for this soil. The included areas make up less than 8 percent of the acreage.

This soil is unsuited to crops or pasture, but it is well suited to trees. All the acreage is in native hardwoods. (Capability unit VIIe–2; woodland suitability group 2r8)

Porters loam, 40 to 70 percent slopes (PoG).—This soil occurs on side slopes. The areas are generally long and narrow, roughly paralleling the major streams. They are about 50 to 500 acres in size.

Included in mapping were a few small areas where the surface layer is fine sandy loam. In a few places, especially in cove areas, small areas of Tusquitee soils were included. A few areas were included where the slope is outside the range for this soil. The included areas make up less than 7 percent of the acreage.

The slope makes this soil suited only to forestry. Runoff is very rapid. All the acreage is in native hardwoods. (Capability unit VIIe–2; woodland suitability group 2r9)

Rabun Series

The Rabun series consists of moderately deep to deep, well-drained soils that formed in residuum weathered from hornblende gneiss and diorite. These soils occur as a few widely scattered areas in the mountainous part of the county. The slope ranges from 10 to 70 percent, but in most places it is 35 to 50 percent.

In a representative profile the surface layer is dark reddish-brown loam about 4 inches thick. The subsoil is dark-red clay about 35 inches thick. Weathered rock that crushes to sandy clay loam begins at a depth of about 39 inches. The depth to hard rock ranges from 3 to 5 feet.

The natural fertility is moderate. The organic-matter content and the available water capacity are medium. Water enters the soil at a moderately rapid rate, and permeability is moderate. Rainfall is well distributed throughout the growing season.

All the acreage is in native hardwoods.

Representative profile of Rabun loam, 10 to 25 percent slopes, in a hardwood area, 2½ miles southwest of Pinnacle Mountain:

Ap—0 to 4 inches, dark-reddish-brown (5YR 3/3) loam; moderate, medium, granular structure; very friable; many roots; many large pores; a few small fragments of relic rock, less than 5 centimeters in size; very strongly acid, pH 5.0; abrupt, smooth boundary.
B21t—4 to 20 inches, dark-red (2.5YR 3/6) clay; weak, medium, angular and subangular blocky structure; firm; many roots; many fine and medium pores; thin, continuous clay films; few small fragments of relic rock; strongly acid, pH 5.2; clear, wavy boundary.
B22t—20 to 36 inches, dark-red (10R 3/6) clay; moderate, medium to coarse, angular and subangular blocky structure; firm; moderately thick clay films; strongly acid, pH 5.5; diffuse, irregular boundary.
B3t—36 to 39 inches, dark-red (10R 3/6) clay; weak, medium, platy structure; firm; thick, patchy clay films; strongly acid, pH 5.4; diffuse, broken boundary.
C—39 to 44 inches, weathered hornblende gneiss and diorite rocks; massive; crushes to sandy clay loam.

The solum ranges from 30 to 40 inches in thickness. The A horizon is cobbly loam or loam and ranges from 4 to 6 inches in thickness. It is dark reddish brown, dark red, or dusky red. The Bt horizon is dark-red or dusky-red clay or clay loam and ranges from 24 to 36 inches in thickness. The depth to hard rock ranges from 3 to 5 feet. The A horizon is strongly acid to very strongly acid, and the B and C horizons are medium acid to strongly acid.

Rabun soils commonly adjoin Clifton soils. They have a darker red subsoil than those soils.

Rabun loam, 10 to 25 percent slopes (RbE).—This soil has the profile described as representative of the series. It occurs on ridgetops and short to long side slopes. The areas are irregular in shape and about 15 acres in size.

Included in mapping were a few small areas where the surface layer is fine sandy loam or gravelly loam. A few areas were included where the slope is outside the range for this soil. Also included were a few small areas of Clifton soils. The included areas make up less than 10 percent of the acreage.

The slope makes this soil unsuited to row crops. Pasture or forest are suitable uses. Runoff is very rapid.

About 5 percent of the acreage is used for crops, 5 percent for pasture, and 90 percent for forest. (Capability unit VIe–1; woodland suitability group 2r8)

Rabun cobbly loam, 25 to 40 percent slopes (RaF).—The profile of this soil is similar to the profile described as representative of the series, except that it contains 20 to 50 percent stones, 3 to 10 inches in diameter, throughout the profile. This soil generally occurs on long slopes in areas about 100 acres in size.

Included in mapping were a few small areas where the surface layer is fine sandy loam or loam. Also included were a few small areas of Clifton soils. In a few included areas, the slope is outside the range for this soil. The included areas make up less than 8 percent of the acreage.

Stoniness and the slope make this soil unsuited to pasture or crops, but the soil is well suited to woodland. Runoff is very rapid.

All the acreage is in native hardwoods. (Capability unit VIIe–2; woodland suitability group 2x8)

Rabun cobbly loam, 40 to 70 percent slopes (RaG).—The profile of this soil is similar to the profile described as representative of the series, except that 20 to 50 percent of the soil mass consists of stones, 3 to 10 inches in diameter. This soil occurs on side slopes, generally as long, narrow areas about 100 acres in size.

Included in mapping were a few small areas where the surface layer is fine sandy loam or loam. Also included were a few small areas of Clifton soils. In a few included areas the slope is outside the range for this soil. The included areas make up less than 10 percent of the acreage.

Stoniness and the slope make this soil unsuited to crops or pasture, but the soil is well suited to trees. All the acreage is in native hardwoods. (Capability unit VIIe–2; woodland suitability group 2r9)

Rock Land

Rock land (Ro) consists of granite or schist rock outcrop and adjoining areas of soil material. The rock outcrop makes up about 50 to 75 percent of the acreage, and the areas of soil material make up 25 to 50 percent. The soil material is 8 to 20 inches deep over bedrock. It ranges from loamy coarse sand to sandy loam in texture and from grayish brown to light yellowish brown in color. The slope ranges from about 15 to 90 percent.

This land type is poorly suited to trees, shrubs, or grasses, but some of each survive for years in pockets of soil material and in crevices between rocks. The areas can be developed for recreational use, but limitations are severe. They provide little food or cover for wildlife. (Capability unit VIIIs–1; not in a woodland suitability group)

Saluda Series

The Saluda series consists of well-drained, shallow soils overlying saprolite. These soils formed in material weathered from granite and gneiss. They occur in the mountainous area of the county at elevations ranging from 1,400 to 3,500 feet. The slope ranges from 10 to 70 percent, but in most places it is 40 to 60 percent.

In a representative profile the surface layer is very dark grayish-brown sandy loam about 2 inches thick. The subsurface layer is brown sandy loam. The subsoil is strong-brown sandy clay loam about 12 inches thick. Weathered rock begins at a depth of about 18 inches. The depth to hard rock is 3 to 10 feet.

Fertility is moderate, and the organic-matter content is medium. The available water capacity is medium to low. Water enters the soil at a moderately rapid rate, and permeability is moderate. Most of the acreage is in native hardwoods.

Representative profile of Saluda sandy loam, 10 to 25 percent slopes, in native hardwoods, 325 feet north of Laurel Fork Gap and 15 miles northwest of Pickens:

O1—2 inches to ½ inch, loose leaves.

O2—½ inch to 0, loose leaves and organic debris, partly decomposed.

A1—0 to 2 inches, very dark grayish-brown (10YR 3/2) sandy loam; weak, medium, granular structure; very friable; many fine roots; a few angular pebbles of quartz, 15 to 25 millimeters in length; strongly acid; abrupt, smooth boundary.

A2—2 to 6 inches, brown (7.5YR 5/4) sandy loam; weak, medium, granular structure; very friable; abundant roots; many large pore spaces; few, small, angular pebbles of quartz, 15 to 25 millimeters in length; strongly acid; clear, smooth boundary.

B2t—6 to 18 inches, strong-brown (7.5YR 5/6) sandy clay loam; weak, medium, angular blocky and subangular blocky structure; friable; thin, patchy clay films; many fine and medium fragments of granite rock, 2 to 5 millimeters in length; many medium and coarse roots; strongly acid; clear, wavy boundary.

C—18 to 38 inches, weathered saprolite from granite; massive; rock-controlled structure; crushes to sandy loam; very strongly acid.

The solum ranges from 10 to 20 inches in thickness. The A horizon is very dark grayish brown, brown, dark yellowish brown, or strong brown. The Bt horizon is brownish yellow, brown, strong brown, yellowish red, or reddish yellow in color and sandy clay loam, loam, or clay loam in texture. The content of clay in the Bt horizon ranges from 15 to 30 percent. The structure of the Bt horizon is weak to moderate, angular to subangular blocky, and the thickness ranges from 10 to 16 inches. The C horizon is highly weathered granite, gneiss, or schist that is variable in color. Colors are predominantly chroma 3 or less. The depth to hard rock ranges from 3 to 10 feet. Few to common coarse fragments ranging from gravel to boulder size occur throughout the profile. Reaction is strongly acid to very strongly acid throughout.

Saluda soils commonly adjoin Ashe, Edneyville, and Hayesville soils. They have a finer textured subsoil than Ashe soils, and they are shallower than Edneyville and Hayesville soils.

Saluda sandy loam, 10 to 25 percent slopes (SaE).—This soil has the profile described as representative of the series. It occurs on ridgetops and side slopes. The areas are irregular in shape and about 50 acres in size.

Included in mapping were a few small areas of Ashe, Edneyville, and Hayesville soils. Also included were a few areas where the slope is outside the range for this soil. The included areas make up less than 7 percent of the acreage.

Tilth is good, and the soil is easy to manage. The slope and the thin surface layer and subsoil make this soil unsuited to cultivation. Permanent pasture and woodland are suitable uses. About 10 percent of the acreage is used for permanent pasture, and 90 percent for woodland. (Capability unit VIe–2; woodland suitability group 4d2)

Saluda sandy loam, 25 to 40 percent slopes (SaF).—This soil occurs on long side slopes. The areas are irregular in shape and about 100 acres in size.

Included in mapping were a few small areas of Ashe, Edneyville, and Hayesville soils. Also included were a

few areas where the slope is outside the range for this soil. The included areas make up less than 7 percent of the acreage.

The slope and the shallowness of this soil make it suited only to woodland. All the acreage is now in native hardwoods. (Capability unit VIIe–2; woodland suitability group 4d2)

Saluda sandy loam, 40 to 70 percent slopes (SaG).—This soil occurs on long side slopes that commonly parallel the major streams. The areas are commonly 50 to 300 acres in size.

Included in mapping were a few small areas of Ashe, Edneyville, and Hayesville soils. Also included were a few areas where the slope is outside the range for this soil. The included areas make up less than 10 percent of the acreage.

Because of slope and the thin surface layer and subsoil, this soil is suited only to trees. An adequate woodland cover should be maintained at all times to protect the soil from erosion. (Capability unit VIIe–2; woodland suitability group 4d3)

Starr Series

The Starr series consists of deep, well-drained soils that formed in alluvial or colluvial deposits in the Piedmont area of the county. The soils occur in depressed upland areas and along and contiguous to the heads of small drainageways. The areas are widely scattered and elongated, and they range from 3 to 20 acres in size.

In a representative profile the surface layer is dark reddish-brown loam about 10 inches thick. The subsoil is dark-red light clay loam and clay loam in the upper part and yellowish-red clay loam in the lower part. The substratum is red and yellowish-red sandy loam. It begins at a depth of about 53 inches.

Tilth is good, and the soil can be cultivated throughout a wide range of moisture content. Water enters the soil at a moderate rate, and permeability is moderate. Fertility is moderate. The organic-matter content and the available water capacity are medium.

Because of its topographic position, this soil is well supplied with moisture throughout the growing season. It is well suited to home garden sites. Most of the acreage has been cultivated, but many areas are now in loblolly pines.

Representative profile of Starr loam, 0 to 6 percent slopes, in a forested area, 5 miles northwest of Clemson, 800 feet south of Lawrence Chapel Church, in the southwestern part of the county:

Ap—0 to 10 inches, dark reddish-brown (5YR 3/4) loam; moderate, medium, granular structure; very friable; many coarse and medium roots; many large pores; medium acid, pH 5.7; abrupt, smooth boundary.

B21—10 to 30 inches, dark-red (2.5YR 3/6) light clay loam; weak, medium, subangular blocky structure; friable; many fine roots; many fine and medium pores; few fine mica flakes; medium acid, pH 5.9; clear, wavy boundary.

B22—30 to 42 inches, dark-red (2.5YR 3/6) clay loam; weak, medium, subangular blocky and blocky structure; friable; few fine roots; few medium pores; few fine mica flakes; medium acid, pH 5.8; clear, wavy boundary.

B23—42 to 53 inches, yellowish-red (5YR 4/8) clay loam; weak, medium, subangular blocky structure; friable; very few fine roots; few fine and medium pores; medium acid, pH 5.9; gradual, wavy boundary.

IIC—53 to 70 inches, red (2.5YR 4/6) mixed with yellowish-red sandy loam; about 30 percent gravel; pebbles range from 5 to 70 millimeters in size; massive; friable; medium acid, pH 5.9.

The A horizon is dark brown to dark reddish brown and dark red and ranges from 7.5YR to 2.5YR in hue. The B horizon ranges from dark red to strong brown in hues of 2.5YR to 7.5YR. The texture of this horizon commonly is light clay loam but ranges to sandy clay loam, silty clay loam, and heavy loam. The content of clay at a depth between 10 and 40 inches averages about 27 percent but ranges from 18 to 35 percent. The B horizon ranges from 20 to 50 inches in thickness and from weak to moderate in structure. In many places a buried B horizon occurs at a depth of 40 inches or more. In places there is a gravel or stone line at the top of this old land surface. The C horizon commonly ranges from red to grayish brown in color and is cobbly or gravelly. In places few to common pebbles occur throughout the solum. Bedrock begins at a depth of more than 10 feet.

These soils have an irregular distribution of organic-matter content with depth. The soils are strongly acid to medium acid throughout the solum.

Starr soils commonly adjoin Hiwassee, Cecil, and Madison soils. They have a less well developed subsoil than those soils.

Starr loam, 0 to 6 percent slopes (StB).—This soil has the profile described as representative of the series. It occurs on basal slopes and in minor depressions along drainageways. The areas are elongated and 5 to 20 acres in size. Included in mapping were small areas where the surface layer is sandy loam or gravelly sandy loam. In places some very small areas of soils that have a lighter colored surface layer were included. Also included were a few areas where the slope is outside the range for this soil. These included areas make up less than 8 percent of the acreage.

This soil is easily managed. Crops respond well to applications of lime and fertilizer. Erosion is not a hazard, and the soil can be used intensively for row crops. Because of its topographic position, it has very favorable moisture conditions and drought is seldom a problem. It is subject to infrequent flooding. (Capability unit IIe–1; woodland suitability group 1o7)

Stony Land

Stony land (St) consists of areas (fig. 5) where stones cover about 3 to 15 percent of the surface. The stones are about 1 foot in diameter and are about 2½ to 5 feet apart. The slope ranges from 6 to 50 percent but commonly is 15 to 40 percent.

The soil material is similar to that of the adjacent soils, and the stones are of the same kind as the underlying rock. The stones are of schist, gneiss, and granite, and they are about 6 to 24 inches across. Included in mapping were areas where large boulders occur intermittently on steep, broken slopes.

The natural fertility and the organic-matter content are low. Water enters and moves through the soil at a rapid rate; the available water capacity is low.

Most of the acreage is in undesirable hardwoods. Machinery cannot be used on this land type; work must be done with hand tools. This land is suited to trees, wildlife habitat, and recreational uses. In the management of these soils, stones are the main concern. (Capability unit VIIs–2; not in a woodland suitability group)

Figure 5.—An area of Stony land. Large stones and boulders on the surface and throughout the soil restrict the growth of trees and make harvesting operations extremely difficult.

Tallapoosa Series

The Tallapoosa series consists of shallow, well-drained, highly micaceous soils overlying weathered rock. These soils formed in residuum weathered from quartz mica schist and micaceous gneiss. They occur in the Piedmont area of the county on short to long side slopes. The slope ranges from 6 to 80 percent, but in most places it is 15 to 25 percent.

In a representative profile the surface layer is dark grayish-brown and dark-brown loam about 7 inches thick. The subsoil is reddish, micaceous sandy clay loam about 9 inches thick. Deeply weathered, micaceous rock that crushes to sandy loam begins at a depth of about 16 inches. The depth to broken rock is 20 to 40 inches. The soils are very strongly acid.

Water enters the soils at a moderate rate, and permeability is moderate. Fertility, the organic-matter content, and the available water capacity are low. The soils tend to be droughty and are poorly suited to most of the commonly grown crops. Most of the acreage is in native hardwoods, but a few abandoned fields are in pine trees.

Representative profile of Tallapoosa loam, 25 to 40 percent slopes, in a forested area, 1 mile southwest of Lawrence Chapel Church, in the southwestern part of the county:

O1—1½ inches to ½ inch, loose leaves, undecomposed.
O2—½ inch to 0, matted organic matter, partly decomposed.
A11—0 to 4 inches, dark grayish-brown (10YR 4/2) loam; weak, medium, granular structure; very friable; many fine and medium roots; many large pores; many fine mica flakes; strongly acid; clear, smooth boundary.
A12—4 to 7 inches, dark-brown (10YR 4/3) loam that has a slick, greasy feel; weak, medium, granular structure; very friable; abundant small and medium roots; many large pores; many fine mica flakes; strongly acid; abrupt, wavy boundary.
B2t—7 to 16 inches, light-red (2.5YR 6/8), yellowish-red (5YR 5/8), and red (10R 5/8), micaceous heavy sandy clay loam; crushed color is yellowish red (5YR 5/8); weak, medium, subangular blocky structure; friable; few, thin, patchy clay films; variegated colors inherited from rock material; strongly acid; diffuse, wavy boundary.
C—16 to 40 inches, deeply weathered, highly micaceous sandy loam material; rock-controlled structure; weathered biotite mica schist, biotite mica gneiss, and mixtures of granite and gneiss that have a high content of mica.

The solum ranges from 10 to 20 inches in thickness. The A horizon is dark grayish brown, dark brown, brown, or strong brown and ranges from 3 to 8 inches in thickness. The Bt horizon is silty clay loam, heavy sandy clay loam, or clay loam and ranges from 3 to 10 inches in thickness. The thin Bt horizon

is continuous throughout at least 85 percent of the soil. The C horizon is soft weathered rock of sandy loam or loam texture. It is mottled and streaked with browns, reds, and pinks. Reaction is strongly acid to very strongly acid throughout.

Tallapoosa soils commonly adjoin Madison soils. They have a thinner solum than those soils, and they contain less clay in the B horizon.

Tallapoosa loam, 6 to 15 percent slopes (TaD).—This soil occurs on short to long slopes. The areas are irregular in shape and about 5 to 30 acres in size. Included in mapping were a few small areas of Madison soils where the combined thickness of the surface layer and subsoil is more than 20 inches. A few areas were included where the slope is outside the range for this soil. The included areas make up less than 5 percent of the acreage.

This soil tends to be droughty. It responds moderately well to applications of lime and fertilizer. Erosion is a severe hazard.

This soil is not suited to cultivated crops, but is suited to permanent pasture or woodland. About 5 percent of the acreage is in pasture and the rest in woodland. (Capability unit VIe–2; woodland suitability group 4o1)

Tallapoosa loam, 15 to 25 percent slopes (TaE).—This soil occupies short to long side slopes. The areas are irregular in shape and about 10 to 40 acres in size. Included in mapping were a few small areas of Madison soils. Also included were a few areas where the slope is outside the range for this soil. The included areas make up less than 7 percent of the acreage.

Runoff is rapid, and erosion is a very severe hazard. The soil is not suited to crops or pasture, but it is moderately well suited to woodland. (Capability unit VIIe–2; woodland suitability group 4r2)

Tallapoosa loam, 25 to 40 percent slopes (TaF).—This soil has the profile described as representative of the series. It occupies short to long side slopes. The areas are irregular in shape and about 30 acres in size. Included in mapping were a few small areas of Madison soils. Also included were a few small areas where the slope is outside the range for this soil. The included areas make up less than 7 percent of the acreage.

Runoff is rapid, and erosion is a very severe hazard because of the slope and the shallowness of this soil. The soil is not suited to cultivated crops or pasture, but it is moderately well suited to trees. All the acreage is in woodland. (Capability unit VIIe–2; woodland suitability group 4r2)

Tallapoosa loam, 40 to 80 percent slopes (TaG).—This soil occupies short to long side slopes. The areas are irregular in shape and about 50 acres in size. Included in mapping were a few small areas of Madison soils. A few small areas were included where the slope is outside the range for this soil. Also included were areas of Musella soils. The included areas make up about 30 percent of the acreage.

Runoff is very rapid on this shallow soil, and erosion is a very severe hazard. (Capability unit VIIe–2; woodland suitability group 4r3)

Toccoa Series

The Toccoa series consists of deep, well-drained soils that formed on bottom lands adjoining the major streams. These are recent alluvial soils that make up long areas paralleling the streams.

In a representative profile the surface layer is dark-brown sandy loam about 11 inches thick. The next layers, to a depth of about 46 inches, are dark-brown and brown, very friable fine sandy loam. Below this is dark-brown, very friable, very fine sandy loam and brown, very friable sandy loam.

Water enters these soils at a moderately rapid rate, and permeability is moderate. Fertility is moderate, and the organic-matter content is low. The available water capacity is medium.

These soils are suited to most of the commonly grown crops. Most of the acreage is cultivated or in pasture. The soils are subject to frequent flooding.

Representative profile from an area of Toccoa soils, in a cultivated field adjacent to the Saluda River, about 1 mile south of Freeman Bridge, in the northeastern part of the county:

Ap—0 to 11 inches, dark-brown (7.5YR 4/4) sandy loam; weak, medium, granular structure; very friable; many large pores; few mica flakes; medium acid; clear, smooth boundary.

C1—11 to 20 inches, dark-brown (7.5YR 4/2) fine sandy loam; a few splotches, 15 to 25 millimeters wide, of dark yellowish brown (10YR 4/4); structureless; very friable; many fine roots; many large pores; a few mica flakes; medium acid; clear, smooth boundary.

C2—20 to 32 inches, dark-brown (10YR 4/3) fine sandy loam; small bedding planes of dark yellowish brown (10YR 4/4); structureless; very friable; many fine roots and a few coarse roots; many large pores; a few mica flakes; medium acid; clear, smooth boundary.

C3—32 to 46 inches, brown (10YR 4/3) fine sandy loam; a few thin bedding planes of yellowish brown; structureless; very friable; many fine roots; many large pores; few to common fine mica flakes; medium acid; clear, smooth, boundary.

C4—46 to 64 inches, dark-brown (10YR 4/3) very fine sandy loam; structureless; very friable; few fine and medium roots; many medium and fine pores; common fine mica flakes; medium acid; diffuse, smooth boundary.

C5—64 to 84 inches, brown (7.5YR 5/4) sandy loam; structureless; very friable; few mica flakes; medium acid.

The texture of the uppermost 40 inches averages sandy loam or fine sandy loam, but the texture throughout the profile ranges from silt loam to loamy sand. The A horizon ranges from brown to dark grayish brown and dark brown in color and from 7 to 11 inches in thickness. The C horizon ranges from brown and dark brown to pale brown in color. Gray mottles are in some profiles at a depth below 20 inches. Few to many mica flakes are present throughout the profile. Bedding planes occur throughout the C horizon in some profiles. The soils are medium acid to slightly acid throughout.

Toccoa soils (To).—These are deep, well-drained, nearly level soils on flood plains along the major streams. The areas are long and about 100 to 200 acres in size. The slope ranges from 0 to 3 percent. Included in mapping were a few small areas of Chewacla soils at slightly lower positions on first bottoms. The included areas make up less than 5 percent of the acreage.

The soils are flooded one to three times annually, but the floodwaters generally recede within 24 hours.

Tilth is good, and the soils are easy to manage. The soils are well suited to corn (fig. 6), hay crops, and pasture grasses. Crops respond well to applications of lime and fertilizer. (Capability unit IIw–2; woodland suitability group 1o7)

Figure 6.—An area of Toccoa soils. After harvest of a good corn crop, stalks are shredded and left on the surface.

Tusquitee Series

The Tusquitee series consists of deep, well-drained soils that formed in colluvial-alluvial deposits in the mountainous area of the county. These soils are along the drainageways on basal slopes. The soil materials that formed the deposits washed from higher lying adjacent areas. These soils occur as relatively long, narrow areas about 5 to 20 acres in size. The slope ranges from 4 to 10 percent.

In a representative profile the surface layer is very dark brown loam about 8 inches thick. The subsoil is dark reddish-brown loam about 8 inches thick overlying brown clay loam about 36 inches thick. The depth to bedrock is more than 5 feet.

Water enters these soils at a moderate rate, and permeability is moderately rapid. The natural fertility and the organic-matter content are high. The available water capacity is medium.

Most of the acreage is in mixed broadleaf and needleleaf forest.

Representative profile of Tusquitee loam, 4 to 10 percent slopes, in a hardwood forest area, three-quarters of a mile southwest of Sassafras Mountain fire tower:

O1—2½ inches to ½ inch, loose leaves and organic debris, undecomposed.

O2—½ inch to 0, matted organic matter, partly decomposed.

A1—0 to 8 inches, very dark brown (10YR 2/2) loam; moderate, medium, granular structure; very friable; many medium and small roots; many large pores; medium acid, pH 5.6; clear, wavy boundary.

B1—8 to 16 inches, dark reddish-brown (5YR 3/3) loam; weak, medium, granular structure; very friable; many medium and fine roots; many medium pores; strongly acid, pH 5.5; clear, wavy boundary.

B2t—16 to 52 inches, brown (7.5YR 4/4) clay loam; weak, medium, subangular blocky structure; friable; thin, continuous clay films; many roots; many fine pores; few fine mica flakes; strongly acid, pH 5.4.

The solum ranges from 40 to 60 inches or more in thickness. The A horizon is 6 to 15 inches thick. It ranges from very dark brown to dark brown in hues of 10YR or 7.5YR. The Bt horizon ranges from sandy clay loam to clay loam in texture and from 30 to 40 inches in thickness. It is brown, strong brown, or dark reddish brown in color. The soils are medium acid to strongly acid throughout.

Tusquitee soils are geographically associated with Porters and Hayesville soils. They have a thicker solum than Porters soils and a less reddish B horizon than Hayesville soils.

Tusquitee loam, 4 to 10 percent slopes (TuC).—In most places areas of this soil are long and moderately wide; they range from 5 to 20 acres in size. Included in mapping were a few small areas where the slope is outside the range for this soil, as well as a few stony areas. Also included were a few small areas of Porters and Hayesville soils. The included areas make up less than 5 percent of the acreage.

This is one of the most productive soils in the mountainous area. Because of its topographic position, it receives moisture from adjacent slopes and is well supplied with moisture throughout the growing season. Erosion is the main hazard.

Much of the acreage is in inaccessible areas of the mountains. About 10 percent is used for crops, and 90 percent for woodland. (Capability unit IIIe–1; woodland suitability group 2o7)

Worsham Series

The Worsham series consists of deep, poorly drained soils that developed in residuum weathered from granite and gneiss in the Piedmont area of the county. The soils are gently sloping. They occur as long, narrow areas adjoining the minor drainageways. The areas are about 5 to 30 acres in size.

In a representative profile the surface layer is very dark gray sandy loam about 5 inches thick. The subsurface layer is gray sandy loam about 4 inches thick. The upper part of the subsoil is grayish-brown, mottled sandy clay loam; the lower part is gray, mottled sandy clay. The subsoil is about 22 inches thick. The substratum is gray, mottled clay loam.

Infiltration is moderate, internal drainage is very slow, and permeability is moderately slow. Seepage water from adjacent slopes keeps the soils wet at all times. Fertility and the organic-matter content are low. The available water capacity is medium.

Most of the acreage is used for pasture or for mixed broadleaf and needleleaf forest.

Representative profile of Worsham sandy loam, 2 to 6 percent slopes, in a wooded area, 2¼ miles southeast of the city limits of Easley:

O1—2 inches to ½ inch, loose leaves and pine needles, largely undecomposed.

O2—½ inch to 0, matted organic matter, partly decomposed.

A1—0 to 5 inches, very dark gray (10YR 3/1) sandy loam; weak, medium, granular structure; very friable; many medium and fine roots; many medium and coarse pores; very strongly acid, pH 5.0; abrupt, smooth boundary.

A2—5 to 9 inches, gray (10YR 5/1) sandy loam streaked with brown (10YR 5/3) and dark brown (7.5YR 3/2); weak, fine, granular structure; very friable; many fine and medium roots; many medium pores; very strongly acid, pH 4.7; abrupt, smooth boundary.

B1g—9 to 15 inches, grayish-brown (2.5Y 5/2) sandy clay loam; common, medium, distinct mottles of light olive brown (2.5Y 5/4) and light gray (2.5Y 7/2); few, fine, faint mottles of yellowish brown (10YR 5/6); weak, medium, subangular blocky structure; friable; few fine roots; few fine pores; very strongly acid, pH 4.6; gradual, wavy boundary.

B2tg—15 to 31 inches, gray (N 6/0) sandy clay; common, medium, distinct mottles of yellowish brown (10YR 5/6), brownish yellow (10YR 6/6), and light brownish

gray (2.5Y 6/2); moderate, medium and coarse, subangular blocky structure; firm; few medium and fine roots; few medium pores; thin clay films; slightly sticky; very strongly acid, pH 4.5; gradual, wavy boundary.

Cg—31 to 44 inches, gray (N 6/0) clay loam; many, medium, prominent mottles of light olive brown (2.5Y 5/6) and yellowish brown (10YR 5/6); common, medium, distinct mottles of light brownish gray (10YR 6/2); massive; firm; few large grains of quartz; few fine mica flakes; very strongly acid, pH 4.7.

The solum ranges from 30 to 60 inches in thickness. The A1 horizon is very dark gray, dark gray, very dark grayish brown, or dark grayish brown. The A2 horizon is gray, grayish brown, or light brownish gray. The Bt horizon is clay, sandy clay, or heavy clay loam. The color is light gray, gray, or light brownish gray in hues of 10YR or 2.5Y. In some places the Bt horizon is neutral. Mottles range from faint to distinct in hues of 10YR or yellower. The depth to hard rock ranges from 5 to 10 feet. Reaction ranges from strongly acid to extremely acid throughout the profile.

Worsham soils commonly adjoin Cecil, Grover, and Madison soils. They are more poorly drained than those soils.

Worsham sandy loam, 2 to 6 percent slopes (WoB).—This soil occurs as long, narrow areas paralleling the minor drainageways. The areas are about 5 to 30 acres in size. Included in mapping were a few small areas where the slope is outside the range for this soil. The included areas make up less than 3 percent of the acreage.

Seepage water from adjacent slopes helps to make the soil wet at all times. The soil is not suited to crops, but some areas have been cleared and are used for pasture. It provides many good sites for farm ponds for watering livestock and for recreation. (Capability unit Vw–1; woodland suitability group 2w8.)

Use and Management of the Soils

The soils of Pickens County are used extensively for row crops, close-growing crops, vegetables, and pasture. This section contains information about the use and management of the soils for crops and pasture, woodland, wildlife habitat, engineering, and town and country planning. Also given are estimated yields of principal crops grown under two levels of management.

The management of crops and pasture, of woodland, and of wildlife habitat is discussed by groups of soils. To learn the group classification of an individual soil, refer to the "Guide to Mapping Units" at the back of this publication.

Capability Grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The soils are grouped according to their limitations when used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for range, for forest trees, or for engineering.

In the capability system, the kinds of soils are grouped at three levels: the capability class, the subclass, and the unit. These are discussed in the following paragraphs.

Capability Classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use, defined as follows:

Class I. Soils have few limitations that restrict their use. (None in Pickens County.)

Class II. Soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III. Soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.

Class IV. Soils have very severe limitations that reduce the choice of plants, require very careful management, or both.

Class V. Soils are subject to little or no erosion but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife habitat.

Class VI. Soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife habitat.

Class VII. Soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife habitat.

Class VIII. Soils and landforms have limitations that preclude their use for commercial plant production and restrict their use to recreation, wildlife habitat, or water supply, or to esthetic purposes.

Capability Subclasses are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry. The *c* subclass is not used in Pickens County.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by *w*, *s*, and *c*, because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

Capability Units are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass

symbol, for example, IIe–2 or IIIe–1. Thus, in one symbol the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraphs; and the Arabic numeral specifically identifies the capability unit within each subclass.

Management by capability units

In this section each capability unit is described, and some suggestions for use and management of the soils are given. To maintain productivity, it is necessary to apply lime and fertilizer according to the requirements of the crop to be grown, as indicated by soil tests.

In the following pages the capability units in Pickens County are described. To learn the capability unit for each soil, refer to the "Guide to Mapping Units" at the back of this publication.

CAPABILITY UNIT IIe–1

This unit consists of gently sloping, deep to moderately deep, well-drained soils. The surface layer is loam, sandy loam, or fine sandy loam. The subsoil is friable to firm clay loam, clay, sandy clay, loam, sandy clay loam, or silty clay loam.

The infiltration rate and permeability are moderate. The available water capacity is medium to low. The organic-matter content is medium to low, and natural fertility is low to moderate.

All farming should be on the contour to reduce the hazard of erosion. Close-growing crops, such as small grain, legumes, or grasses, should be grown in strips on these soils each year (fig. 7). The strips should be used on half the acreage.

Crop residue kept on or near the surface increases the infiltration rate and reduces the erosion hazard. Crop residue mixed into the soil helps to maintain the organic-matter content and to improve tilth.

CAPABILITY UNIT IIe–2

Grover fine sandy loam, 2 to 6 percent slopes, eroded, is the only soil in this unit. This is a well-drained soil that is moderately deep to deep to saprolite. The subsoil is sandy clay loam.

Infiltration and permeability are moderate. The available water capacity is medium. The organic-matter content and fertility are low.

Erosion is a hazard. Terraces, stripcropping, adequate crop rotations, and management of crop residue help to control erosion. Keeping close-growing crops on this soil at least half the time also helps to control erosion.

CAPABILITY UNIT IIe–3

Helena sandy loam, 2 to 6 percent slopes, is the only soil in this unit. This is a moderately well drained soil. The subsoil is sandy clay loam underlain by firm clay.

Figure 7.—Cotton and small grain in contour strips on Cecil sandy loam, 2 to 6 percent slopes, eroded. This soil is in capability unit IIe–1.

Infiltration is moderate, and permeability is moderately slow. The available water capacity is medium. The organic-matter content is medium, and natural fertility is moderate.

Erosion is the chief hazard on this soil, but internal drainage is a secondary limitation. Terraces, grassed waterways, farming on the contour, adequate cropping systems, and residue management help to control erosion.

CAPABILITY UNIT IIw–2

This unit consists only of Toccoa soils. These are deep, well-drained, nearly level soils on flood plains. The surface layer is sandy loam, silt loam, or loamy sand. This is underlain by sandy loam that extends from 3 to 10 feet or more. These soils are flooded one to three times annually (fig. 8). The duration of flooding is generally 24 hours or less.

Infiltration is moderately rapid, and permeability is moderate. The available water capacity is medium. The organic-matter content is low, and natural fertility is moderate.

Crop residue should be kept on or near the surface. This increases the available water capacity and helps to maintain the organic-matter content.

CAPABILITY UNIT IIIe–1

This unit consists of moderately deep to deep, well-drained, gently sloping to sloping soils on uplands. The surface layer is loam, sandy loam, fine sandy loam, or clay loam. The subsoil is friable to firm clay loam, clay, sandy clay, or loam.

Infiltration is moderate, and permeability is moderate to moderately rapid. The available water capacity is medium to low. Natural fertility is low to high.

Erosion is a severe hazard, and intensive management is needed to control erosion and maintain productivity. Adding large amounts of organic matter and keeping a close-growing crop on the soil two-thirds of the time help to control erosion and improve tilth. Such practices as terracing, keeping grass in waterways, cultivating on the contour, stripcropping, and using cropping systems are needed when these soils are cultivated (fig. 9).

CAPABILITY UNIT IIIe–3

Cataula sandy loam, 2 to 6 percent slopes, eroded, is the only soil in this unit. This soil is shallow to moderately deep over a fragipan. It is well drained. The subsoil is firm to extremely firm or brittle clay loam, clay, sandy clay, or sandy clay loam that restricts root growth in places.

Infiltration is moderate, and permeability is slow. The available water capacity is medium. The organic-matter content and natural fertility are low.

In cultivated areas, intensive management is needed to control erosion and maintain productivity. Effective practices for controlling erosion include keeping grass in waterways, terracing, tilling on the contour, using crop residue, and stripcropping, in combination with an improved cropping system.

CAPABILITY UNIT IIIw–2

Chewacla loam is the only soil in this unit. This is a nearly level, somewhat poorly drained soil. The subsoil is silt loam to silty clay loam.

***Figure 8.*—An area of Toccoa soils near Weaver Creek at flood stage. These soils are subject to flooding that damages crops and causes severe problems for homeowners. They are in capability unit IIw–2.**

Infiltration and permeability are moderate. The available water capacity is medium to high. The organic-matter content is medium, and natural fertility is moderate.

This soil is subject to flooding, and some crop damage can be expected. The soil can be used for crops year after year if adequate water management is practiced. Drainage, channel improvement, and flood control measures are needed. All crop residue should be returned to the soil.

CAPABILITY UNIT IIIs–2

Buncombe loamy sand is the only soil in this unit. This is a nearly level, deep, excessively drained soil. It is loose loamy sand to a depth of 30 to 60 inches or more.

Infiltration is rapid, and permeability is moderately rapid. The available water capacity is low. The organic-matter content and natural fertility are low.

Most of the acreage is in woodland, but a few areas are cultivated or are in pasture. The soil is not well suited to winter pasture. It is poorly suited to cotton but is fairly well suited to most other crops grown in the county. Occasional flooding is a hazard.

CAPABILITY UNIT IVe–1

This unit consists of moderately deep to deep, well-drained, gently sloping, sloping, and strongly sloping soils on uplands. The surface layer is sandy loam, fine sandy loam, or clay loam. The subsoil is friable to firm clay loam, clay, sandy clay, or sandy clay loam.

Infiltration and permeability are moderate. The available water capacity is medium to low. The organic-matter content and natural fertility are low to medium.

Erosion is a very severe hazard. Intensive management that controls erosion and maintains productivity is needed. A close-growing crop on these soils two-thirds of the time helps to control erosion and improve tilth. Terraces,

Figure 9.—Stripcropping on Cecil sandy loam, 6 to 10 percent slopes, eroded. This soil is in capability unit IIIe–1.

grassed waterways, contour cultivation, stripcropping, and cropping systems are needed practices when the soils are cultivated.

CAPABILITY UNIT IVe–2

Cataula sandy loam, 6 to 10 percent slopes, eroded, is the only soil in this unit. This is a well-drained soil that is shallow to moderately deep to a fragipan. The surface layer is very friable. The subsoil is very firm to extremely firm clay or clay loam overlying a brittle sandy clay loam or sandy clay fragipan.

Infiltration is moderate, and permeability is slow. The available water capacity is medium. The organic-matter content and natural fertility are low.

Erosion is a very severe hazard. Intensive management to control erosion and maintain productivity is needed. A close-growing crop two-thirds of the time helps to control erosion and improve tilth. Terracing, keeping grass in waterways, cultivating on the contour, stripcropping, and using adequate cropping systems are needed practices when the soil is cultivated.

CAPABILITY UNIT Vw–1

Worsham sandy loam, 2 to 6 percent slopes, is the only soil in this unit. This is a deep, poorly drained soil. It occurs in depressed areas and at the heads of drainageways. The surface layer is friable. The subsoil is firm clay loam, clay, or sandy clay.

Infiltration is moderate, and permeability is moderately slow. The available water capacity is medium. The organic-matter content and natural fertility are low.

Some areas have been cleared and are used for pasture. Fescue, clover, and bermudagrass are fairly well suited pasture plants.

Seepage from adjacent slopes contributes to much of the wetness of this soil. Hillside drainage ditches help to correct some of the drainage problems.

CAPABILITY UNIT Vw–2

This unit consists only of Chewacla soils, frequently flooded. These are nearly level, somewhat poorly drained soils. The surface layer is silt loam, loam, or fine sandy loam about 6 inches thick. Below this, the texture ranges from loam to silty clay loam.

Infiltration and permeability are moderate. The available water capacity is medium to high. The organic-matter content is medium, and natural fertility is moderate.

These soils are not suited to cultivated crops, because of the high water table and frequent flooding. If drained and

protected from flooding, they are suited to corn, small grain, soybeans, bahiagrass, tall fescue, and white clover. Most of the acreage is in woodland, which is a suitable use.

CAPABILITY UNIT VIe–1

This unit consists of strongly sloping to moderately steep, moderately deep to deep, well-drained soils. The surface layer is sandy loam, fine sandy loam, loam, or clay loam. It is underlain by friable to firm clay, sandy clay, sandy clay loam, or clay loam. The root zone is moderately deep to deep.

Infiltration is moderately rapid to moderate, and permeability is moderate. The available water capacity is medium to low. Natural fertility is moderate to low. The organic-matter content is low to medium.

The less eroded soils of this unit are suited to permanent pasture, but careful management, including liberal fertilization, is needed. Pasture plants respond to additions of lime, but the soils are better suited to trees than to pasture.

CAPABILITY UNIT VIe–2

This unit consists of sloping to moderately steep, shallow to moderately deep, well-drained to excessively drained soils. The surface layer is very friable sandy loam or loam. The subsoil is friable to very friable sandy loam, loam, clay loam, silty clay loam, or sandy clay loam. The root zone is shallow to moderately deep.

Infiltration and permeability are moderate to moderately rapid. The available water capacity is medium to low. The organic-matter content is medium to low, and natural fertility is moderate to low.

The soils of this unit are not suited to cultivated crops. When properly managed and fertilized, they are fairly well suited to tall fescue, bermudagrass, white clover, and lespedeza. Controlled grazing helps to keep a good cover on these soils.

CAPABILITY UNIT VIe–3

Cataula clay loam, 6 to 15 percent slopes, severely eroded, is the only soil in this unit. This is a well-drained soil that is shallow to moderately deep to a fragipan. The surface layer is friable. The subsoil is very firm to extremely firm clay loam to clay. Below this is a brittle fragipan of sandy clay loam or sandy clay. The root zone is moderately deep to shallow.

Infiltration is moderate, and permeability is slow. The available water capacity is medium. Natural fertility and the organic-matter content are low.

This soil is not suited to cultivated crops. If heavily fertilized and limed, it is fairly well suited to bermudagrass, sericea lespedeza, and annual lespedeza. Controlled grazing is needed to keep a good cover on this soil.

CAPABILITY UNIT VIIe–1

This unit consists of strongly sloping to very steep, well-drained soils. The surface layer is sandy loam, fine sandy loam, loam, or clay loam. The subsoil is friable to firm clay loam, sandy clay, or clay. The root zone is shallow to moderately deep.

Infiltration and permeability are moderate. The available water capacity is medium to low. The organic-matter content is low to medium, and natural fertility is moderate to low.

The soils of this unit are not suited to cultivated crops or pasture, because of the slope. They are suited to forest and to use as habitat for wildlife.

CAPABILITY UNIT VIIe–2

This unit consists of strongly sloping to very steep, well-drained to excessively drained soils. The surface layer is friable or very friable sandy loam, fine sandy loam, loam, or cobbly loam. It is underlain by clay loam, sandy loam, sandy clay loam, clay, loam, or silty clay loam. The root zone is deep to shallow.

Infiltration and permeability are moderate to moderately rapid. The available water capacity is medium to low. The organic-matter content and natural fertility are variable.

The soils of this unit are not suited to cultivated crops or pasture. They are suited to trees.

CAPABILITY UNIT VIIs–2

This unit consists only of Stony land. This land type occurs in areas where stones cover about 3 to 15 percent of the surface. The slope ranges from 6 to more than 40 percent. In most places the stones are 1 foot or more in diameter. In a few places there are huge boulders on steep, broken slopes.

The surface layer of the soil between stones is loam, fine sandy loam, or sandy loam that varies in depth. The subsoil, where present, is sandy loam to sandy clay loam.

Infiltration, permeability, the available water capacity, the organic-matter content, and natural fertility are variable.

Areas of this land type are suited to forestry, but harvesting timber is difficult.

CAPABILITY UNIT VIIIs–1

This unit consists of Rock land. Rock outcrops cover 50 to 90 percent of the surface. Areas that contain both schist and granite rock are included. This unit consists of areas of very thin soil adjoining rock outcrops and also small areas of very thin soil occurring independently of rock outcrops.

Infiltration and permeability are rapid in the soil materials. The available water capacity, the organic-matter content, and natural fertility are low.

A few scattered trees grow on the areas of this unit. Recreation and wildlife habitat are suitable uses.

Estimated Yields

Estimates of average yields of principal crops grown under two levels of management are shown in table 2. Listed in columns A are the yields to be expected under common management. Yields listed in columns B are those to be expected under improved management.

The figures in columns A and B are based largely on observations made by members of the soil survey party and on information obtained in interviews with farmers and other agricultural workers who have had experience with the soils and crops of the area. For some crops, actual yield data were available. Also available were some experimental test data on yields on eroded and sloping soils. Irrigation was not considered in any of the estimates.

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TABLE 2.—*Estimated average yields per acre of*

Soils	Corn		Soybeans	
	A	B	A	B
	Bu.	*Bu.*	*Bu.*	*Bu.*
Ashe sandy loam, 10 to 25 percent slopes				
Ashe sandy loam, 25 to 40 percent slopes				
Ashe sandy loam, 40 to 90 percent slopes				
Buncombe loamy sand	30	55	15	25
Cataula sandy loam, 2 to 6 percent slopes, eroded	30	55	16	30
Cataula sandy loam, 6 to 10 percent slopes, eroded	20	40	15	28
Cataula clay loam, 6 to 15 percent slopes, severely eroded				
Cecil sandy loam, 2 to 6 percent slopes, eroded	35	75	20	40
Cecil sandy loam, 6 to 10 percent slopes, eroded	30	60	18	35
Cecil sandy loam, 10 to 15 percent slopes, eroded	22	45	17	30
Cecil clay loam, 2 to 6 percent slopes, severely eroded	25	50	15	30
Cecil clay loam, 6 to 10 percent slopes, severely eroded	20	35	12	22
Chewacla loam	30	60		
Chewacla soils, frequently flooded				
Clifton fine sandy loam, 15 to 35 percent slopes				
Edneyville fine sandy loam, 10 to 25 percent slopes				
Edneyville fine sandy loam, 25 to 40 percent slopes				
Edneyville fine sandy loam, 40 to 80 percent slopes				
Grover fine sandy loam, 15 to 25 percent slopes				
Grover fine sandy loam, 2 to 6 percent slopes, eroded	30	80	16	32
Grover fine sandy loam, 6 to 15 percent slopes, eroded	20	60	15	30
Grover fine sandy loam, 25 to 40 percent slopes				
Grover fine sandy loam, 40 to 80 percent slopes				
Gwinnett sandy loam, 25 to 40 percent slopes				
Gwinnett sandy loam, 40 to 60 percent slopes				
Hayesville fine sandy loam, 15 to 40 percent slopes				
Hayesville fine sandy loam, 40 to 80 percent slopes				
Helena sandy loam, 2 to 6 percent slopes	20	70	13	25
Hiwassee clay loam, 2 to 6 percent slopes, eroded	20	35	15	25
Hiwassee clay loam, 6 to 10 percent slopes, severely eroded	15	30	12	22
Hiwassee clay loam, 10 to 25 percent slopes, severely eroded				
Hiwassee sandy loam, 2 to 6 percent slopes, eroded	30	70	18	35
Hiwassee sandy loam, 6 to 10 percent slopes, eroded	25	55	18	35
Hiwassee sandy loam, 10 to 25 percent slopes, eroded				
Louisburg sandy loam, 10 to 25 percent slopes				
Louisburg sandy loam, 25 to 40 percent slopes				
Madison clay loam, 10 to 25 percent slopes, severely eroded				
Madison sandy loam, 2 to 6 percent slopes, eroded	35	75	20	40
Madison sandy loam, 6 to 10 percent slopes, eroded	30	65	18	35
Madison sandy loam, 10 to 25 percent slopes, eroded				
Musella soils, 40 to 80 percent slopes				
Pacolet clay loam, 2 to 10 percent slopes, severely eroded	18	40	12	25
Pacolet clay loam, 10 to 25 percent slopes, severely eroded				
Pacolet fine sandy loam, 2 to 6 percent slopes, eroded	30	50	25	40
Pacolet fine sandy loam, 6 to 10 percent slopes, eroded	20	35	18	35
Pacolet fine sandy loam, 10 to 25 percent slopes, eroded				
Pacolet fine sandy loam, 25 to 40 percent slopes				
Pacolet fine sandy loam, 40 to 80 percent slopes				
Porters loam, 15 to 40 percent slopes				
Porters loam, 40 to 70 percent slopes				
Rabun loam, 10 to 25 percent slopes				
Rabun cobbly loam, 25 to 40 percent slopes				
Rabun cobbly loam, 40 to 70 percent slopes				
Rock land				
Saluda sandy loam, 10 to 25 percent slopes				
Saluda sandy loam, 25 to 40 percent slopes				
Saluda sandy loam, 40 to 70 percent slopes				
Starr loam, 0 to 6 percent slopes	40	85	22	45
Stony land				
Tallapoosa loam, 25 to 40 percent slopes				

See footnote at end of table.

principal crops under two levels of management

Cotton		Wheat		Oats		Pasture			
						Fescue and white clover		Common bermudagrass	
A	B	A	B	A	B	A	B	A	B
Lb. of lint	*Lb. of lint*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Cow-acre-days* [1]
						90	120	80	100
		15	25	30	50	60	90	40	75
375	650	20	35	30	45	100	170	90	160
325	600	18	28	30	45	90	160	110	140
						80	120	90	130
450	750	22	40	40	70	100	180	110	165
375	650	20	35	35	60	90	165	110	145
325	525	20	32	30	45	90	160	105	140
325	600	18	30	32	55	90	150	80	150
300	500	14	25	25	40	85	145	75	135
						170	260	95	170
						100	120	40	90
						85	150	85	150
						90	140	90	150
						80	140	90	150
325	625	18	32	32	75	100	170	90	160
300	500	18	30	25	55	90	150	110	145
300	525	18	30	30	60	85	160	85	150
300	500	18	30	32	50	90	150	80	150
275	425	14	25	25	40	85	145	70	130
						80	140	70	120
400	700	22	40	40	70	100	180	100	165
350	625	20	35	35	60	100	165	90	160
						95	150	85	150
475	850	22	40	40	70	100	180	100	165
400	700	20	32	35	60	100	175	95	165
						90	160	90	150
300	400	14	25	25	35	85	145	75	135
400	500	22	40	35	40	100	165	110	165
375	475	20	35	30	40	90	165	110	145
						90	160	90	150
						90	165	95	160
						90	170	90	150
450	575	28	50	45	75	210	225	150	180

TABLE 2.—*Estimated average yields per acre of*

Soils	Corn		Soybeans	
	A	B	A	B
	Bu.	*Bu.*	*Bu.*	*Bu.*
Tallapoosa loam, 6 to 15 percent slopes				
Tallapoosa loam, 15 to 25 percent slopes				
Tallapoosa loam, 40 to 80 percent slopes				
Toccoa soils	60	85		
Tusquitee loam, 4 to 10 percent slopes	40	85	18	35
Worsham sandy loam, 2 to 6 percent slopes				

[1] Cow-acre-days is a term used to express the carrying capacity of pasture. It is the number of animal units carried per acre multiplied by the number of days the pasture is grazed during a single grazing season without injury to the sod. An acre of pasture that provides 30 days of grazing for 2 cows has a carrying capacity of 60 cow-acre-days.

To obtain yields similar to those in columns B, the following good management practices are recommended:

1. Proper choice and rotation of crops.
2. Correct use of fertilizer, lime, manure, and trace elements.
3. Use of proper methods of tillage.
4. Maintenance of the organic-matter content.
5. Adequate control of water.
6. Maintenance and improvement of productivity and tilth.
7. Conservation of soil material, plant nutrients, and soil moisture.
8. Use of seed of highest quality.
9. Control of insects and disease.
10. Observance of proven planting dates.
11. Thorough preparation of soils at the proper time.
12. Maintenance of a deep root zone to prevent traffic pans.
13. Control of weeds.

Soils should be tested to determine their need for fertilizer and lime. Information on soil testing is available through the local Soil Conservation Service representative or the county agent.

Frequent tillage alters soil structure and depletes organic matter. Tillage is needed only for preparing good seedbeds and controlling weeds. To prevent formation of

TABLE 3.—*Suitability of selected*

Soil	Corn	Soybeans
Buncombe loamy sand	Fairly well suited	Fairly well suited
Cataula sandy loam, 2 to 6 percent slopes, eroded	Fairly well suited	Fairly well suited
Cataula sandy loam, 6 to 10 percent slopes, eroded	Fairly well suited	Fairly well suited
Cecil clay loam, 2 to 6 percent slopes, severely eroded	Fairly well suited	Fairly well suited
Cecil clay loam, 6 to 10 percent slopes, severely eroded	Not well suited	Not well suited
Cecil sandy loam, 2 to 6 percent slopes, eroded	Well suited	Well suited
Cecil sandy loam, 6 to 10 percent slopes, eroded	Well suited	Well suited
Cecil sandy loam, 10 to 15 percent slopes, eroded	Fairly well suited	Fairly well suited
Chewacla loam	Fairly well suited	Fairly well suited
Grover fine sandy loam, 2 to 6 percent slopes, eroded	Fairly well suited	Fairly well suited
Grover fine sandy loam, 6 to 15 percent slopes, eroded	Fairly well suited	Fairly well suited
Helena sandy loam, 2 to 6 percent slopes	Fairly well suited	Fairly well suited
Hiwassee sandy loam, 2 to 6 percent slopes, eroded	Well suited	Well suited
Hiwassee sandy loam, 6 to 10 percent slopes, eroded	Well suited	Well suited
Hiwassee clay loam, 2 to 6 percent slopes, eroded	Fairly well suited	Fairly well suited
Hiwassee clay loam, 6 to 10 percent slopes, severely eroded	Not well suited	Not well suited
Madison sandy loam, 2 to 6 percent slopes, eroded	Well suited	Well suited
Madison sandy loam, 6 to 10 percent slopes, eroded	Well suited	Well suited
Pacolet fine sandy loam, 2 to 6 percent slopes, eroded	Well suited	Well suited
Pacolet fine sandy loam, 6 to 10 percent slopes, eroded	Well suited	Well suited
Pacolet clay loam, 2 to 10 percent slopes, severely eroded	Not well suited	Not well suited
Starr loam, 0 to 6 percent slopes	Well suited	Well suited
Toccoa soils	Well suited	Not well suited
Tusquitee loam, 4 to 10 percent slopes	Well suited	Fairly well suited

principal crops under two levels of management—Continued

Cotton		Wheat		Oats		Pasture			
						Fescue and white clover		Common bermudagrass	
A	B	A	B	A	B	A	B	A	B
Lb. of lint	*Lb. of lint*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Cow-acre-days* [1]
						85	120	80	100
						180	200	150	180
		20	35	35	60	200	275	120	180
						70	110	70	110

pans, the depth of plowing and of other tillage operations should be varied. The soils should not be tilled when they are too wet.

Deep-rooted legumes should be included in the cropping system to improve soil structure, increase the penetration of moisture, prevent the formation of pans, and supply organic matter and nitrogen. Most upland soils need 1 to 2 tons of agricultural limestone per acre to produce good yields of legumes. Legumes are likely to deplete the moisture reserve of the soils, and this may affect the growth of crops that follow.

Crop residue should not be burned. If turned under, it improves soil structure, fertility, and tilth and also helps to keep the soils porous and permeable.

The use of manure is especially helpful in establishing grasses in eroded areas and in waterways. Manure supplies plant nutrients and acts as a mulch.

Practices to control water erosion include:

1. Terracing where slopes are suitable.
2. Establishing native and tame grasses in waterways and outlets.
3. Using diversions.
4. Tilling and planting on the contour.
5. Utilizing crop residue.
6. Installing check dams, grade-stabilization structures, or other structures where needed.

In table 3 selected soils are rated according to their suitability for the principal crops.

soils for principal crops

Cotton	Wheat	Oats	Pasture	
			Tall fescue and white clover	Common bermudagrass
Poorly suited	Fairly well suited	Fairly well suited	Not well suited	Fairly well suited.
Fairly well suited	Fairly well suited	Fairly well suited	Well suited	Well suited.
Fairly well suited	Fairly well suited	Fairly well suited	Well suited	Well suited.
Fairly well suited	Fairly well suited	Fairly well suited	Fairly well suited	Fairly well suited.
Not well suited	Fairly well suited	Fairly well suited	Fairly well suited	Fairly well suited.
Well suited	Well suited	Well suited	Well suited	Well suited.
Well suited	Well suited	Well suited	Well suited	Well suited.
Fairly well suited	Fairly well suited	Fairly well suited	Well suited	Well suited.
Poorly suited	Fairly well suited	Fairly well suited	Well suited	Well suited.
Fairly well suited	Fairly well suited	Fairly well suited	Well suited	Well suited.
Fairly well suited	Fairly well suited	Fairly well suited	Fairly well suited	Fairly well suited.
Fairly well suited	Fairly well suited	Fairly well suited	Fairly well suited	Well suited.
Well suited	Well suited	Well suited	Well suited	Well suited.
Fairly well suited	Well suited	Well suited	Well suited	Well suited.
Not well suited	Fairly well suited	Fairly well suited	Fairly well suited	Fairly well suited.
Not well suited	Fairly well suited	Fairly well suited	Fairly well suited	Fairly well suited.
Well suited	Well suited	Well suited	Well suited	Well suited.
Well suited	Well suited	Well suited	Well suited	Well suited.
Well suited	Well suited	Well suited	Well suited	Well suited.
Fairly well suited	Fairly well suited	Well suited	Well suited	Well suited.
Not well suited	Fairly well suited	Fairly well suited	Fairly well suited	Fairly well suited.
Well suited	Well suited	Well suited	Well suited	Well suited.
Poorly suited	Poorly suited	Poorly suited	Well suited	Well suited.
Poorly suited	Well suited	Well suited	Well suited	Well suited.

Use of the Soils for Woodland [2]

Approximately 70 percent of Pickens County is woodland. Approximately 3,300 acres is productive reserved woodland; the rest is commercial woodland. Ninety-six percent of the woodland is privately owned, and 4 percent is publicly owned.

About 28 percent of the commercial woodland is of the loblolly-shortleaf pine forest type; 22 percent is oak-pine; 46 percent is oak-hickory; 2 percent is white pine-hemlock; and 2 percent is elm-ash-cottonwood (*6*).

During 1968–69, approximately 215 acres was planted to pines and hardwoods (*10*). Since 1929, 16,542 acres has been planted.

Loblolly pine and eastern white pine are the primary species planted; a few slash and longleaf pines, Arizona cypress, redcedar, yellow-poplar, and miscellaneous hardwoods also are planted. Loblolly pine, shortleaf pine, oaks, and hickories grow on the uplands. Virginia pine grows on some of the severely eroded soils and is effective in controlling erosion. Yellow-poplar, white pine, hemlock, oaks, hickories, and other upland hardwoods are in coves and drainageways. Bottom-land hardwoods are on flood plains.

Woodland suitability grouping

The soils of Pickens County have been placed in 22 woodland suitability groups. Rock land and Stony land are variable and are not placed in a woodland suitability group or rated for productivity, hazards, or limitations. Each group is made up of soils that are capable of producing similar kinds of wood crops, that need similar management to produce these crops, and that have about the same potential productivity. The woodland group for each soil can be identified by referring to the "Guide to Mapping Units" at the back of this publication.

Each woodland group is identified by a three-part or four-part symbol, such as 1o7, 2s8, 4c2e.

The first element of the group symbol indicates the woodland suitability class. It expresses site quality by an Arabic numeral ranging from 1 to 5; soils in class 1 have the highest potential productivity. Table 4, Guide for woodland suitability classes, shows indicator forest type or tree species.

The second element in the symbol indicates the suitability subclass. It expresses selected soil properties that cause moderate to severe hazards or limitations in woodland use or management. It is identified by one of the following:

Subclass x (stoniness or rockiness). Soils that have restrictions or limitations for woodland use or management because of stones or rocks.

Subclass w (excessive wetness). Soils in which excessive water, either seasonally or the year around, causes significant limitations for woodland use or management. These soils have restricted drainage, a high water table, or a flooding hazard that adversely affects stand development or management.

Subclass d (restricted rooting depth). Soils that have restrictions or limitations for woodland use or management because of restricted rooting depths. Soils shallow to hard rock, a hardpan, or other layers in the soil that restrict roots are examples.

[2] By GEORGE E. SMITH, Jr., woodland conservationist, Soil Conservation Service, Columbia.

TABLE 4.—*Guide for woodland suitability classes*

Indicator forest type or tree species	Site index [1]				
	Class 1 (very high)	Class 2 (high)	Class 3 (moderately high)	Class 4 (moderate)	Class 5 (low)
Cottonwood	106+	96–105	86–95	76–85	75–
Yellow-poplar	106+	96–105	86–95	76–85	75–
Sweetgum	96+	86–95	76–85	66–75	65–
Water oaks	96+	86–95	76–85	66–75	65–
Eastern white pine	96+	86–95	76–85	66–75	65–
Loblolly pine	96+	86–95	76–85	66–75	65–
Shortleaf pine	86+	76–85	66–75	56–65	55–
Upland oaks	86+	76–85	66–75	56–65	55–
Eastern redcedar	66+	56–65	46–55	35–45	35–
American sycamore	106+	96–105	86–95	76–85	75–

[1] Site index is based on the height of the dominant trees in the stand at age 50, except for cottonwood and American sycamore. Site index for cottonwood is based on the height attained at age 30, and for American sycamore at age 35.

Subclass c (clayey soils). Soils that have restrictions or limitations for woodland use or management because of the kind or amount of clay in the upper part of the soil profile.

Subclass s (sandy soils). Sandy soils that have little or no clay accumulation in the subsoil and have moderate to severe restrictions or limitations for woodland use or management. These soils have limitations for use of equipment, have low moisture-holding capacity, and normally are low in available plant nutrients. Where they occur in river bottoms, however, the available moisture supply generally is very favorable for tree growth.

Subclass r (relief or slope). Soils that have restrictions or limitations for woodland use or management because of the slope.

Subclass o (slight or no limitations). Soils that have no significant restrictions or limitations for woodland use or management.

Some kinds of soil may have more than one set of subclass characteristics. Priority in placing each kind of soil into a subclass is in the order that the subclass characteristics are listed above.

The third element in the symbol indicates the degree of hazards or limitations and the general suitability of the soils for certain kinds of trees. The three management problems considered are erosion hazard, equipment limitations, seedling mortality, and windthrow hazard.

The numeral 1 indicates soils that have slight management problems or none and are suited to needleleaf trees.

The numeral 2 indicates soils that have one or more moderate management problems and are suited to needleleaf trees.

The numeral 3 indicate soils that have one or more severe management problems and are suited to needleleaf trees.

The numeral 4 indicates soils that have slight management problems or none and are suited to broadleaf trees.

The numeral 5 indicates soils that have one or more moderate management problems and are suited to broadleaf trees.

The numeral 6 indicates soils that have one or more severe management problems and are suited to broadleaf trees.

The numeral 7 indicates soils that have slight management problems or none and are suited to either needleleaf or broadleaf trees.

The numeral 8 indicates soils that have one or more moderate management problems and are suited to either needleleaf or broadleaf trees.

The numeral 9 indicates soils that have one or more severe management problems and are suited to either needleleaf or broadleaf trees.

A fourth element, the letter "e," has been used to place some severely eroded soils into separate subgroups.

Ratings for potential erosion hazard, equipment limitations, seedling mortality, and windthrow hazard, are explained below:

Potential erosion hazard of the soil in woodland use following cutting operations, or where the soil is exposed along roads, trails, firebreaks, or log-yard areas is rated. A rating of slight indicates that problems of erosion control are not significant. A rating of moderate indicates some attention must be given to prevent unnecessary soil erosion. A rating of severe indicates that intensive treatments or special equipment and methods of operation should be planned to minimize soil erosion. The potential erosion hazard is based on slope, soil depth, and erodibility and on soil-loss tolerance.

Equipment limitations reflect limitations in the use of equipment for managing or harvesting the tree crop. A rating of slight indicates equipment use is seldom limited in kind of equipment or time of year. A rating of moderate indicates a need for modified equipment or seasonal restrictions because of slope, stoniness, obstructions, wetness, or flooding. A rating of severe indicates the need for specialized equipment because of one or more of the factors listed for moderate.

The degree of expected seedling mortality during the first two growing seasons after planting or seeding is rated. Normal rainfall, adequate site preparation, good planting stock, proper planting methods, and appropriate protection and cultivation are assumed. A rating of slight indicates that unsatisfactory survival on less than 25 percent of the area is likely. A rating of moderate indicates that unsatisfactory survival is likely on 25 to 50 percent of the area planted. A rating of severe indicates that unsatisfactory survival is likely on more than 50 percent of the area.

Windthrow hazard refers to the danger of trees being blown over by wind. A rating of slight indicates trees are commonly not expected to blow down in ordinary winds. A rating of moderate indicates that some trees are expected to blow down during periods when the soils are excessively wet and wind velocities are high. A rating of severe indicates that many trees can be expected to blow down during periods when the soil is wet and winds are moderate or high.

The woodland suitability groups are described in the following pages. Listed in the description of each group are important tree species and site class, as well as species suitable for planting.

WOODLAND SUITABILITY GROUP 1o7

This group consists of very highly productive soils that have no serious management problems. The soils are well suited to broadleaf and needleleaf trees.

Important tree species and productivity, or site class, are:

Loblolly pine	100	Red oak	90
Shortleaf pine	80	Sycamore	90
White pine	100	Yellow-poplar	100–110

Species suitable for planting are:

White ash	White pine
Northern red oak	Sycamore
Loblolly pine	Black walnut
Shortleaf pine	Yellow-poplar

WOODLAND SUITABILITY GROUP 1w8

This group consists of very highly productive soils that have moderate equipment limitations because of excess water. The soils are well suited to broadleaf and needleleaf trees.

Important tree species and productivity, or site class, are:

Loblolly pine	100	Red oaks	90
Shortleaf pine	80	Sycamore	90
White pine	90	Yellow-poplar	100

Species suitable for planting are:

Green ash	Loblolly pine
White ash	Shortleaf pine
Northern red oak	White pine

WOODLAND SUITABILITY GROUP 2o7

Tusquitee loam, 4 to 10 percent slopes, is the only soil in this group. It is well suited to broadleaf and needleleaf trees. It is highly productive and has no serious management problems.

Important tree species and productivity, or site class, are:

Loblolly pine	80–90	White pine	90
Pitch pine	70	Upland oaks	70–80
Shortleaf pine	70–80	Yellow-poplar	100+
Virginia pine	70–80		

Species suitable for planting are:

White ash	White pine
Northern red oak	Black walnut
Loblolly pine	Yellow-poplar
Shortleaf pine	Sycamore

WOODLAND SUITABILITY GROUP 2x8

Rabun cobbly loam, 25 to 40 percent slopes, is the only soil in this group. It is suited to broadleaf and needleleaf trees and is highly productive. Equipment limitations caused by stoniness are moderate, and the hazard of erosion is moderate.

Important tree species and productivity, or site class, are:

Loblolly pine	80–90	White pine	90
Pitch pine	70	Upland oaks	70–80
Shortleaf pine	70	Yellow-poplar	100+
Virginia pine	70–80		

Species suitable for planting are:

White ash	Shortleaf pine
Northern red oak	White pine
Loblolly pine	Yellow-poplar

WOODLAND SUITABILITY GROUP 2w8

Worsham sandy loam, 2 to 6 percent slopes, is the only soil in this group. It is suited to broadleaf and needleleaf trees and is highly productive. Equipment limitations caused by seasonal wetness are moderate.

Important tree species and productivity, or site class, are:

Loblolly pine	90	Red oaks	80
Shortleaf pine	70	Yellow-poplar	90
White pine	90		

Species suitable for planting are:

Northern red oak	Black walnut
Loblolly pine	Yellow-poplar
Shortleaf pine	Sycamore
White pine	

WOODLAND SUITABILITY GROUP 2s8

Buncombe loamy sand is the only soil in this group. It is suited to broadleaf or needleleaf trees and is highly productive. Equipment limitations and seedling mortality caused by the sandy texture of the soil are moderate.

Important tree species and productivity, or site class, are:

Loblolly pine	90	White pine	90
Shortleaf pine	70	Sycamore	--
Virginia pine	70–80	Yellow-Poplar	100–110

Species suitable for planting are:

Loblolly pine	White pine
Virginia pine	Sycamore

WOODLAND SUITABILITY GROUP 2r8

This group consists of highly productive soils that are well suited to broadleaf and needleleaf trees. The slope ranges from 10 to 40 percent. Because of the slope, equipment limitations are moderate and the hazard of erosion is moderate.

Important tree species and productivity, or site class, are:

Loblolly pine	80–90	White pine	90
Pitch pine	70	Upland oaks	70–80
Shortleaf pine	70–80	Yellow-poplar	100+
Virginia pine	70–80		

Species suitable for planting are:

White ash	White pine
Northern red oak	Black walnut
Loblolly pine	Yellow-poplar
Shortleaf pine	

WOODLAND SUITABILITY GROUP 2r9

This group consists of highly productive soils that are suited to broadleaf and needleleaf trees. The slope ranges from 40 to 80 percent. Because of the slope, equipment limitations are severe and the hazard of erosion is severe.

Important tree species and productivity, or site class, are:

Loblolly pine	80–90	White pine	90
Pitch pine	70	Upland oaks	70–80
Shortleaf pine	70–80	Yellow-poplar	100+
Virginia pine	70–80		

Species suitable for planting are:

White ash	Shortleaf pine
Northern red oak	White pine
Loblolly pine	Yellow-poplar

WOODLAND SUITABILITY GROUP 3o7

This group consists of moderately highly productive soils that are suited to broadleaf and needleleaf trees. It has no serious management problems.

Important tree species and productivity, or site class, are:

Loblolly pine	80	White oaks	70–80
Shortleaf pine	70	Yellow-poplar	90
Red oaks	70–80	Virginia pine	70+

Species suitable for planting are:

Loblolly pine	Yellow-poplar
Slash pine	White pine
Virginia pine	

WOODLAND SUITABILITY GROUP 3w8

Helena sandy loam, 2 to 6 percent slopes, is the only soil in this group. This is a seasonally wet soil that is moderately highly productive. It is suited to needleleaf and broadleaf trees. Equipment limitations are moderate, and seedling mortality is slight to moderate.

Important tree species and productivity, or site class, are:

Sweetgum	80	Loblolly pine	80
White oaks	70	Yellow-poplar	90
Shortleaf pine	70	Red oaks	70

Species suitable for planting are:

Yellow-poplar	Slash pine
Sweetgum	Sycamore
Loblolly pine	

WOODLAND SUITABILITY GROUP 3r2

This group consists of moderately highly productive soils that are better suited to needleleaf than to broadleaf trees. The slope ranges from 10 to 40 percent. Because of the slope, equipment limitations are moderate and the hazard of erosion is moderate.

Important tree species and productivity, or site class, are:

Virginia pine	70	Loblolly pine	80
White pine	80+	Shortleaf pine	60–70

Species suitable for planting are:

Virginia pine	Loblolly pine
White pine	Shortleaf pine

WOODLAND SUITABILITY GROUP 3r3

Ashe sandy loam, 40 to 90 percent slopes, is the only soil in this group. It is suited to needleleaf trees and is moderately highly productive. Equipment limitations are severe, and the hazard of erosion is severe.

Important tree species and productivity, or site class, are:

Loblolly pine	80	Virginia pine	70
Shortleaf pine	60–70	White pine	80+

Species suitable for planting are:

Loblolly pine	Virginia pine
Shortleaf pine	White pine

WOODLAND SUITABILITY GROUP 3r8

This group consists of moderately steep or steep soils that are suited to broadleaf and needleleaf trees. Productivity is moderately high. Equipment limitations are moderate, and the hazard of erosion is moderate.

Important tree species and productivity, or site class, are:

Loblolly pine	80	Red oaks	70–80
Shortleaf pine	70	White oaks	70–80
Yellow-poplar	90	Virginia pine	70+

Species suitable for planting are:

Loblolly pine	Northern red oak
Slash pine	White pine
Yellow-poplar	Virginia pine

WOODLAND SUITABILITY GROUP 3r9

This group consists of moderately highly productive soils that are suited to broadleaf trees. The slope ranges from 40 to 80 percent. Equipment limitations are severe, and the hazard of erosion is severe.

Important tree species and productivity, or site class, are:

Loblolly pine	80	Red oaks	70–80
Shortleaf pine	70	White oaks	70–80
Yellow-poplar	90	Virginia pine	70+

Species suitable for planting are:

Loblolly pine	Northern red oak
Slash pine	White pine
Yellow-poplar	Virginia pine

WOODLAND SUITABILITY GROUP 4o1

Tallapoosa loam, 6 to 15 percent slopes, is the only soil in this group. It is suited to needleleaf trees and is moderately productive. It has no serious management problems.

Important tree species and productivity, or site class, are:

Loblolly pine	70	Red oaks	70
Shortleaf pine	60	White oaks	70
Virginia pine	60	Yellow-poplar	80

Species suitable for planting are:

Loblolly pine	Slash pine
Eastern redcedar	Virginia pine

WOODLAND SUITABILITY GROUP 4d2

This group consists of shallow, moderately productive soils that are suited to needleleaf trees. Because of shallowness of slope, or both, equipment limitations and the erosion hazard are slight to moderate and seedling mortality and windthrow hazard are moderate.

Important tree species and productivity, or site class, are:

Loblolly pine	70	Virginia pine	60–70
Pitch pine	70	White pine	70
Shortleaf pine	60		

Species suitable for planting are:

Loblolly pine	Shortleaf pine
Pitch pine	White pine

WOODLAND SUITABILITY GROUP 4d3

Saluda sandy loam, 40 to 70 percent slopes, is the only soil in this group. This soil is shallow and moderately productive. It is suited to needleleaf trees. Because of shallowness and the slope, equipment restrictions are moderate to severe, the erosion hazard is severe, and seedling mortality and windthrow hazard are moderate.

Important tree species and productivity, or site class, are:

Loblolly pine	70	Virginia pine	60–70
Pitch pine	70	White pine	70
Shortleaf pine	60		

Species suitable for planting are:

Loblolly pine	Shortleaf pine
Pitch pine	White pine

WOODLAND SUITABILITY GROUP 4c2e

This group consists of eroded or severely eroded, moderately productive soils that are suited to needleleaf trees. The erosion hazard and equipment limitations are moderate, and seedling mortality is slight to moderate.

Important tree species and productivity, or site class, are:

Loblolly pine	70	Red oaks	70
Virginia pine	60	White oaks	60
Shortleaf pine	60		

Species suitable for planting are:

Loblolly pine	Virginia pine
Slash pine	

WOODLAND SUITABILITY GROUP 4c3e

This group consists of moderately steep, severely eroded soils that are suited to needleleaf trees. Productivity is moderate. The erosion hazard and equipment limitations are severe, and seedling mortality is moderate.

Important tree species and productivity, or site class, are:

Loblolly pine	70	Red oaks	70
Shortleaf pine	60	White oaks	60
Virginia pine	60		

Species suitable for planting are:

Loblolly pine	Slash pine
Virginia pine	

WOODLAND SUITABILITY GROUP 4r2

This group consists of moderately steep to steep soils that are suited to needleleaf trees. Productivity is moderate. The erosion hazard and equipment limitations are moderate.

Important tree species and productivity, or site class, are:

Loblolly pine	70	Red oaks	70
Shortleaf pine	60	White oaks	70
Virginia pine	60		

Species suitable for planting are:

Loblolly pine	Virginia pine
Slash pine	Eastern redcedar

WOODLAND SUITABILITY GROUP 4r3

Tallapoosa loam, 40 to 80 percent slopes, is the only soil in this group. It is suited to needleleaf trees and is moderately productive. Equipment limitations are severe, and the erosion hazard is severe.

Important tree species and productivity, or site class, are:

Loblolly pine	70	Red oaks	70
Shortleaf pine	60	White oaks	70
Virginia pine	60		

Species suitable for planting are:

Loblolly pine
Virginia pine

WOODLAND SUITABILITY GROUP 5c3e

Cataula clay loam, 6 to 15 percent slopes, severely eroded, is the only soil in this group. It is suited to needleleaf trees. Productivity is low. The erosion hazard, seedling mortality, and equipment limitations are moderate.

Important tree species and productivity, or site class, are:

Loblolly pine	60	Virginia pine	50
Shortleaf pine	50		

Species suitable for planting are:

Virginia pine
Eastern redcedar
Loblolly pine

Estimated yields of woodland

Recommended cutting and estimated yields from well-stocked, even-aged stands of upland hardwoods managed for pulpwood (*4*) are summarized in table 5. The volume of merchantable wood for loblolly pine plantations (*5*) is shown in figure 10.

Use of the Soils for Wildlife Habitat [3]

The wildlife population of any area depends upon the availability of food, cover, and water in a suitable combination. Wildlife habitat is created, improved, or maintained by establishing desirable vegetation and developing water supplies in suitable places.

In table 6, the soils of this county are rated according to their suitability as sites for producing the elements of wildlife habitat and also for three classes of wildlife. The ratings take into account only the suitability of the soil. They do not take into account the climate, the present use of the soil, or the distribution of wildlife and human populations. The suitability of the individual sites for wildlife habitat requires onsite inspection.

[3] By WILLIAM W. NEELY, biologist, Soil Conservation Service.

TABLE 5.—*Recommended cutting and estimated yields from well-stocked, even-aged stands of upland hardwoods managed for pulpwood*

Kind of cutting	Average stand diameter	Average stand age	Average volume per acre [1]			
			Before this cut	This cut	After this cut	Cumulative cut
	Inches	*Years*	*Cords*	*Cords*	*Cords*	*Cords*
All sites:						
Reproduction cutting	0	0	0	0	0	0
Precommercial thinning	1–3	10	0	0	0	0
Site class 40 (10-year cutting cycle)						
Commercial thinning	6	40	9	3	6	3
Commercial thinning	8	50	17	4	13	7
Harvest cut	10	60	23	23	0	30
Site class 50 (9-year cutting cycle)						
Commercial thinning	6	36	11	4	7	4
Commercial thinning	8	45	19	5	14	9
Harvest cut	10	54	26	26	0	35
Site class 60 (8-year cutting cycle)						
Commercial thinning	6	32	14	5	9	5
Commercial thinning	8	40	22	6	16	11
Harvest cut	10	48	27	27	0	38
Site class 70 (7-year cutting cycle)						
Commercial thinning	6	28	18	6	12	6
Commercial thinning	8	35	22	7	15	13
Harvest cut	10	42	28	28	0	41
Site class 80 (6-year cutting cycle)						
Commercial thinning	6	24	18	6	12	6
Commercial thinning	8	30	24	7	17	13
Harvest cut	10	36	29	29	0	42

[1] Volume of merchantable wood to a 4-inch top.

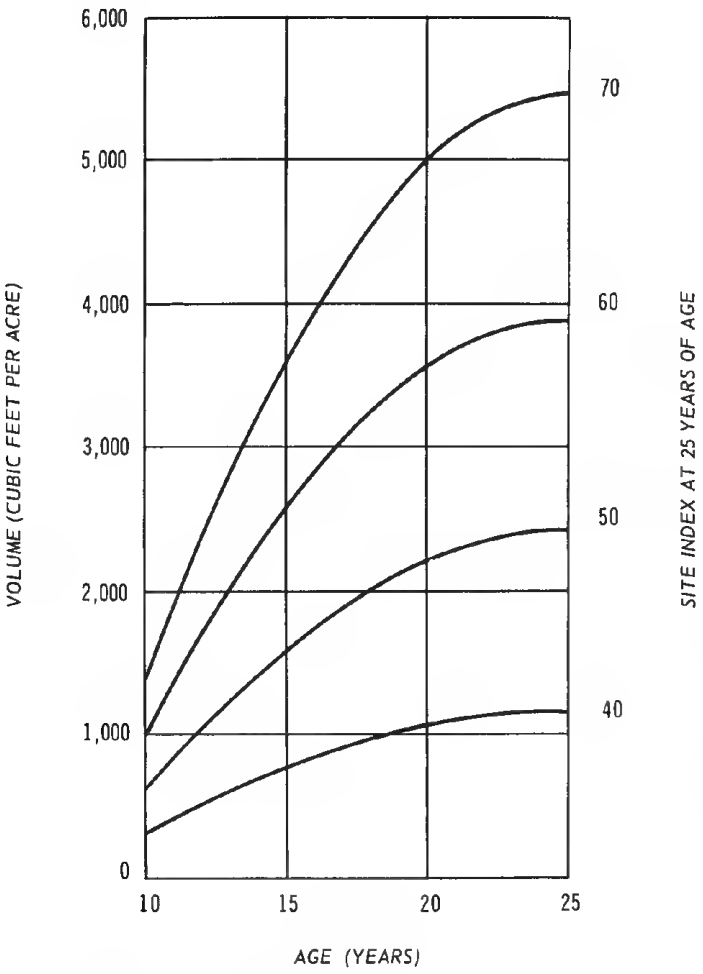

***Figure 10.*—Volume of merchantable wood (inside bark) to a 3-inch top in cubic feet per acre for loblolly pine plantations. Stocking: 700 trees per acre.**

The meanings of the ratings used in table 6 are as follows: "Well suited" means that habitat generally is easily created, improved, or maintained; that the soil has few or no limitations that affect management; and that satisfactory results can be expected. "Suited" means that habitat can be created, improved, or maintained in most places; that the soil has moderate limitations that affect management; and that moderately intensive management and fairly frequent attention may be required for satisfactory results. "Poorly suited" indicates that habitat can be created, improved, or maintained in most places; that the soil has rather severe limitations; that habitat management is difficult and expensive and requires intensive effort; and that results are not always satisfactory. "Unsuited" indicates that it is impractical or perhaps impossible to create, improve, or maintain habitat and that unsatisfactory results are probable.

The significance of each subheading in table 6, under "Elements of wildlife habitat" and "Kinds of wildlife," is given in the following paragraphs.

"Grain and seed crops" refers to grain-producing or seed-producing annual plants grown for wildlife food. Sorghum, browntop millet, cattail millet, corn, wheat, oats, and sunflowers are examples.

"Grasses and legumes" refers to domestic grasses and legumes established by planting to provide food or cover for wildlife. Grasses include ryegrass, bahiagrass, fescue, and panicgrass. Legumes include clover, annual lespedeza, bush lespedeza, and cowpeas.

"Wild herbaceous upland plants" are native or introduced perennial or reseeding grasses, forbs, and weeds that provide food and cover principally for upland wildlife. They are established mainly through natural processes. Beggarweed, wild lespedeza, pokeberry, bristlegrass, crabgrass, croton, and partridgepea are examples.

"Hardwood woody plants" refers to nonconiferous trees, shrubs, and woody vines that produce fruits, nuts, buds, catkins, or foliage (browse) used extensively as food by wildlife. They commonly are established through natural processes but also may be planted. Oak, beech, cherry, hickory, dogwood, viburnum, grapes, greenbriers, sweetgum, and eleagnus are examples.

"Coniferous woody plants" are cone-bearing trees and shrubs. They are important to wildlife mainly as cover but also furnish food in the form of browse, seeds, or fruitlike cones. They may become established through natural processes or may be planted. Typical plants in this category are native cedars, pines, and introduced ornamentals.

"Wetland food and cover plants" are annual and perennial herbaceous plants that grow on moist to wet sites. These plants furnish food or cover mostly for wetland wildlife. Examples are smartweed, wild millet, spikerush and other rushes, sedges, burreed, and aneilema. Submersed or floating aquatics are not included in this category.

"Shallow-water developments" are those where low dikes or other water control structures are established to create habitat principally for waterfowl. They generally are designed to be drained, planted, or flooded.

"Ponds" are small bodies of water deep enough and of suitable quality to be impounded for fish production as one of their primary uses.

"Openland wildlife" are birds and animals that normally live on cropland, pastures, meadows, lawns, and other openland areas where grasses, herbs, and shrubby plants grow. Quail, doves, cottontail rabbits, foxes, meadowlarks, and field sparrows are typical examples of openland wildlife.

"Woodland wildlife" are birds and mammals that normally live in wooded areas of hardwood trees, coniferous trees, and shrubs. Woodcocks, thrushes, vireos, squirrels, deer, raccoons, and wild turkeys are typical examples of woodland wildlife.

"Wetland wildlife" are birds and mammals that normally live in wet areas, marshes, and swamps. Ducks, geese, rails, herons, shore birds, and minks are typical examples of wetland wildlife.

TABLE 6.—*Suitability for elements of*

Soil series and map symbols	Elements of			
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants
Ashe: AsE, AsF, AsG	Unsuited	Unsuited	Poorly suited	Poorly suited
Buncombe: Bu	Unsuited	Unsuited	Poorly suited	Unsuited
Cataula:				
CaD3	Unsuited	Unsuited	Suited	Suited
CdB2	Suited	Suited	Well suited	Well suited
CdC2	Poorly suited	Suited	Suited	Suited
Cecil:				
CeB3	Suited	Suited	Suited	Suited
CeC3	Unsuited	Poorly suited	Suited	Suited
ClB2	Well suited	Well suited	Well suited	Well suited
ClC2	Suited	Suited	Well suited	Well suited
ClD2	Poorly suited	Suited	Suited	Suited
Chewacla:				
Cm	Poorly suited	Suited	Unsuited	Well suited
Co	Unsuited	Unsuited	Unsuited	Well suited
Clifton: CtF	Unsuited	Unsuited	Suited	Suited
Edneyville:				
EdE	Unsuited	Poorly suited	Suited	Suited
EdF, EdG	Unsuited	Unsuited	Poorly suited	Poorly suited
Grover:				
GrB2	Well suited	Well suited	Well suited	Well suited
GrD2	Poorly suited	Suited	Suited	Suited
GrE	Unsuited	Poorly suited	Suited	Suited
GrF	Unsuited	Unsuited	Poorly suited	Poorly suited
GrG	Unsuited	Unsuited	Unsuited	Poorly suited
Gwinnett:				
GwF	Unsuited	Unsuited	Poorly suited	Poorly suited
GwG	Unsuited	Unsuited	Unsuited	Poorly suited
Hayesville:				
HeF	Unsuited	Unsuited	Poorly suited	Poorly suited
HeG	Unsuited	Unsuited	Unsuited	Poorly suited
Helena: HlB	Suited	Suited	Well suited	Well suited
Hiwassee:				
HwB2	Well suited	Well suited	Well suited	Well suited
HwC2	Suited	Suited	Well suited	Well suited
HwE2	Unsuited	Poorly suited	Suited	Suited
HyB2, HyC3	Poorly suited	Suited	Suited	Suited
HyE3	Unsuited	Poorly suited	Suited	Suited
Louisburg:				
LoE	Unsuited	Unsuited	Poorly suited	Poorly suited
LoF	Unsuited	Unsuited	Unsuited	Poorly suited
Madison:				
MaB2	Well suited	Well suited	Well suited	Well suited
MaC2	Suited	Suited	Well suited	Well suited
MaE2	Unsuited	Poorly suited	Suited	Suited
MeE3	Unsuited	Unsuited	Poorly suited	Poorly suited
Musella: MuG	Unsuited	Unsuited	Unsuited	Poorly suited

wildlife habitat and kinds of wildlife

wildlife habitat				Kinds of wildlife		
Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Ponds	Openland	Woodland	Wetland
Poorly suited	Unsuited	Unsuited	Unsuited	Unsuited	Poorly suited	Unsuited.
Unsuited	Unsuited	Unsuited	Unsuited	Poorly suited	Unsuited	Unsuited.
Poorly suited	Unsuited	Unsuited	Poorly suited	Unsuited	Suited	Unsuited.
Suited	Unsuited	Poorly suited	Suited	Well suited	Well suited	Unsuited.
Suited	Unsuited	Unsuited	Suited	Suited	Well suited	Unsuited.
Suited	Unsuited	Unsuited	Suited	Suited	Suited	Unsuited.
Suited	Unsuited	Unsuited	Suited	Suited	Suited	Unsuited.
Well suited	Unsuited	Unsuited	Suited	Well suited	Well suited	Unsuited.
Well suited	Unsuited	Unsuited	Suited	Well suited	Well suited	Unsuited.
Suited	Unsuited	Unsuited	Suited	Suited	Well suited	Unsuited.
Unsuited	Well suited	Well suited	Unsuited	Poorly suited	Well suited	Well suited.
Unsuited	Well suited	Well suited	Unsuited	Unsuited	Well suited	Well suited.
Suited	Unsuited	Unsuited	Unsuited	Unsuited	Suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Poorly suited	Poorly suited	Suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Unsuited	Poorly suited	Unsuited.
Well suited	Unsuited	Unsuited	Suited	Well suited	Well suited	Unsuited.
Suited	Unsuited	Unsuited	Suited	Suited	Well suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Poorly suited	Poorly suited	Suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Poorly suited	Poorly suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Unsuited	Poorly suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Poorly suited	Poorly suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Unsuited	Poorly suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Poorly suited	Poorly suited	Unsuited.
Suited	Unsuited	Unsuited	Suited	Well suited	Well suited	Unsuited.
Well suited	Unsuited	Unsuited	Suited	Well suited	Well suited	Unsuited.
Well suited	Unsuited	Unsuited	Suited	Well suited	Well suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Poorly suited	Poorly suited	Suited	Unsuited.
Suited	Unsuited	Unsuited	Poorly suited	Poorly suited	Suited	Unsuited.
Suited	Unsuited	Unsuited	Poorly suited	Poorly suited	Suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Unsuited	Poorly suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Unsuited	Poorly suited	Unsuited.
Well suited	Unsuited	Unsuited	Suited	Well suited	Well suited	Unsuited.
Well suited	Unsuited	Unsuited	Suited	Well suited	Well suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Poorly suited	Poorly suited	Suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Poorly suited	Poorly suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Unsuited	Poorly suited	Unsuited.

TABLE 6.—*Suitability for elements of*

Soil series and map symbols	Elements of			
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants
Pacolet:				
PaB2	Well suited	Well suited	Suited	Suited
PaC2	Suited	Suited	Suited	Suited
PaE2	Unsuited	Poorly suited	Suited	Suited
PaF	Unsuited	Unsuited	Poorly suited	Poorly suited
PaG	Unsuited	Unsuited	Unsuited	Poorly suited
PcC3	Poorly suited	Poorly suited	Poorly suited	Poorly suited
PcE3	Unsuited	Unsuited	Poorly suited	Poorly suited
Porters:				
PoF	Unsuited	Unsuited	Poorly suited	Poorly suited
PoG	Unsuited	Unsuited	Unsuited	Poorly suited
Rabun:				
RaF, RaG	Unsuited	Unsuited	Unsuited	Poorly suited
RbE	Unsuited	Poorly suited	Suited	Suited
Rock land:[1] Ro				
Saluda:				
SaE	Unsuited	Unsuited	Poorly suited	Poorly suited
SaF, SaG	Unsuited	Unsuited	Unsuited	Poorly suited
Starr: SrB	Well suited	Well suited	Well suited	Well suited
Stony land:[1] St				
Tallapoosa:				
TaD	Unsuited	Unsuited	Poorly suited	Poorly suited
TaE, TaF, TaG	Unsuited	Unsuited	Unsuited	Poorly suited
Toccoa: To	Well suited	Well suited	Suited	Well suited
Tusquitee: TuC	Suited	Suited	Well suited	Well suited
Worsham: WoB	Unsuited	Poorly suited	Unsuited	Suited

[1] Requires onsite determination.

Engineering Uses of the Soils [4]

Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, pipelines, building foundations, facilities for water storage, erosion control structures, sewage disposal systems, and drainage systems. Among the properties most important to the engineer are permeability, shear strength, compaction characteristics, grain size, soil drainage, shrink-swell potential, plasticity, and reaction (pH). The depth to the water table, depth to bedrock, and topography are also important.

[4] By RICHARD G. CHRISTOPHER III, area engineer, Soil Conservation Service.

Information in this survey can be used by engineers to—

1. Make soil and land-use studies that will aid in selecting and developing sites for industrial, commercial, residential, and recreational uses.
2. Make preliminary estimates of the engineering properties of the soils to aid in the planning of agricultural drainage systems, farm ponds, irrigation systems, and diversion terraces.
3. Make preliminary evaluations of soil and ground conditions that will aid in selecting locations for highways, airports, and pipelines and in planning detailed investigations at the selected sites.
4. Estimate the suitability of soils for cross-country movement of vehicles and construction equipment.

wildlife habitat and kinds of wildlife—Continued

wildlife habitat				Kinds of wildlife		
Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Ponds	Openland	Woodland	Wetland
Suited	Unsuited	Unsuited	Suited	Well suited	Suited	Unsuited.
Suited	Unsuited	Unsuited	Suited	Suited	Suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Poorly suited	Poorly suited	Suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Unsuited	Poorly suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Unsuited	Poorly suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Suited	Poorly suited	Poorly suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Unsuited	Poorly suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Poorly suited	Poorly suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Unsuited	Poorly suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Unsuited	Poorly suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Poorly suited	Suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Unsuited	Poorly suited	Unsuited.
Poorly suited	Unsuited	Unsuited	Unsuited	Unsuited	Poorly suited	Unsuited.
Well suited	Suited	Suited	Suited	Well suited	Well suited	Suited.
Poorly suited	Unsuited	Unsuited	Unsuited	Unsuited	Poorly suited	Unsuited.
Unsuited	Unsuited	Unsuited	Unsuited	Unsuited	Poorly suited	Unsuited.
Poorly suited	Suited	Suited	Poorly suited	Well suited	Well suited	Suited.
Well suited	Unsuited	Unsuited	Suited	Well suited	Well suited	Unsuited.
Poorly suited	Suited	Suited	Suited	Poorly suited	Suited	Suited.

5. Correlate performance of engineering structures with soil mapping units so as to develop information that will be useful in designing and maintaining engineering structures.
6. Supplement information obtained from other published maps, reports, and aerial photographs for the purpose of preparing soil maps and reports that can be used readily by engineers.
7. Develop other preliminary estimates for construction purposes pertinent to the area.

With the use of the soil map for identification, the engineering interpretations reported here can be useful for many purposes. It should be emphasized, however, that they do not eliminate the need for sampling and testing at the site of specific engineering works involving heavy loads or excavations deeper than the depths of layers here reported. Even in these situations, the soil map is useful for planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

Some of the terms used in this publication have a special meaning to soil scientists and a special meaning to engineers. The Glossary defines many such terms as they are used in soil science.

Much of the information in this section is in the form of tables. Table 7 gives engineering test data. Table 8 gives estimates of physical and chemical properties of the soils. Table 9 gives interpretations of the soils for various engineering uses.

TABLE 7.—*Engineering*

[Tests performed by the Soil Testing Laboratory, South Carolina State Highway Department, in cooperation with of the American Association

Soil name and location	Parent material	South Carolina report No.	Depth from surface
			Inches
Ashe sandy loam, 10 to 25 percent slopes:			
2½ miles NE. of Rocky Bottom (modal).	Granite rocks that have a high content of quartz.	F31, 455	0–4
		F31, 456	4–12
		F31, 457	12–36
Ashe sandy loam, 40 to 90 percent slopes:			
About 3 miles west-southwest of Rocky Bottom (nonmodal – severely eroded and shallower than normal).	Granite rocks that have a high content of quartz.	F31, 447	0–4
		F31, 448	4–14
Cataula clay loam, 6 to 15 percent slopes, severely eroded:			
About 2 miles south-southeast of Easley (nonmodal—severely eroded and shallower than normal).	Granite and gneiss with admixtures of basic igneous rocks.	F31, 490	0–6
		F31, 491	13–23
		F31, 492	30–50
Cataula sandy loam, 2 to 6 percent slopes, eroded:			
Immediately north of S.C. Highway 134 and about 2 miles SE. of Easley city limits (modal).	Granite and gneiss with admixtures of basic igneous rocks.	F31, 487	6–11
		F31, 488	11–26
		F31, 489	26–44
Immediately south of S.C. Highway 26, 1½ miles SE. of Easley city limits (nonmodal—intergrading toward Cecil; extreme firmness and mottling at greater than normal depth).	Granite and gneiss with admixtures of basic igneous rocks.	F31, 493	0–6
		F31, 494	6–26
		F31, 495	26–50
Cataula sandy loam, 6 to 10 percent slopes, eroded:			
½ mile SE. of Easley, on S.C. Highway 136 (nonmodal—finer textured than normal).	Granite and gneiss with admixtures of basic igneous rocks.	F31, 473	4–12
		F31, 474	12–19
		F31, 475	19–34
Grover fine sandy loam, 2 to 6 percent slopes, eroded:			
¾ mile south of Antioch Church, 4½ miles east-northeast of Easley city limits (modal).	Quartz mica schist and micaceous granite and gneiss.	F31, 438	0–6
		F31, 439	16–28
		F31, 440	28–48
In a wooded area near the Anderson County line, 200 feet NW. of residence (nonmodal—redder than normal, finer textured, and more abundant mottles; intergrading toward Cataula).	Quartz mica schist and micaceous granite and gneiss.	F31, 476	0–5
		F31, 477	19–34
		F31, 478	34–42
Hayesville fine sandy loam, 15 to 40 percent slopes:			
2½ miles north of Rocky Bottom, immediately west of U.S. Highway 178 (modal).	Granite and gneiss	F31, 458	8–14
		F31, 459	14–28
		F31, 460	28–41
Hiwassee sandy loam, 6 to 10 percent slopes, eroded:			
About 2½ miles NE. of Liberty (modal).	Hornblende gneiss, diorite, and gabbro.	F31, 470	9–16
		F31, 471	16–36
		F31, 472	36–52
Madison sandy loam, 6 to 10 percent slopes, eroded:			
1 mile south of Woodall Mountain fire tower (modal).	Quartz mica schist and micaceous granite.	F31, 484	0–5
		F31, 485	9–32
		F31, 486	32–42

[1] Based on AASHO Designation: T99–57 (*1*).

[2] Analysis according to AASHO Designation: T88–57. Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method, and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method, and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analysis data used in this table are not suitable for naming textural classes for soils.

test data

U.S. Department of Transportation, Federal Highway Administration, in accordance with standard procedures of State Highway Officials]

Moisture-density data [1]		Mechanical analysis data [2]			Liquid limit	Plasticity index	Classification	
Optimum moisture content	Maximum dry density	Percentage passing sieve [3]		Particles smaller than 0.005 mm.			AASHO	Unified [4]
		No. 40 (0.42 mm.)	No. 200 (0.074 mm.)					
Percent	*Lb. per cu. ft.*			*Percent*	*Percent*			
18	94	68	26	12	([5])	([5])	A-2-4(0)	SM
14	111	74	33	13	([5])	([5])	A-2-4(0)	SM
16	106	78	26	8	([5])	([5])	A-2-4(0)	SM
([6])	([6])	78	34	12	([5])	([5])	A-2-4(0)	SM
15	108	55	16	3	([5])	([5])	A-2-4(0)	SM
([6])	([6])	82	55	47	40	13	A-6(5)	ML-CL
28	92	90	69	60	72	18	A-7-5(14)	MH
23	97	80	43	27	51	([5])	A-5(2)	SM
([6])	([6])	84	55	46	46	19	A-7-6(8)	ML-CL
25	98	85	67	57	54	22	A-7-5(13)	MH
29	89	90	76	63	74	28	A-7-5(19)	MH
12	118	71	42	29	27	9	A-4(1)	SC
15	113	78	55	48	39	18	A-6(7)	CL
18	107	78	58	51	45	11	A-7-5(6)	ML
([6])	([6])	85	67	54	64	31	A-7-5(18)	CH-MH
23	98	83	61	54	56	14	A-7-5(9)	MH
([6])	([6])	83	59	50	64	24	A-7-5(13)	MH
11	119	73	25	13	([5])	([5])	A-2-4(0)	SM
19	104	79	54	45	47	15	A-7-5(6)	ML
20	105	75	48	40	58	27	A-7-5(10)	SC-SM
([6])	([6])	74	29	18	([5])	([5])	A-2-4(0)	SM
([6])	([6])	85	63	55	53	11	A-7-5(8)	MH
([6])	([6])	78	58	50	50	10	A-5(6)	ML
17	108	91	57	39	37	15	A-6(6)	CL
([6])	([6])	88	38	23	43	12	A-7-5(1)	SM
([6])	([6])	90	62	49	47	18	A-7-6(10)	ML-CL
([6])	([6])	89	65	58	42	15	A-7-6(8)	ML-CL
([6])	([6])	80	66	60	55	14	A-7-5(10)	MH
25	96	86	68	58	55	12	A-7-5(10)	MH
17	109	78	39	27	29	6	A-4(1)	SC-SM
20	103	77	48	36	42	3	A-5(3)	SM
18	107	69	38	25	50	8	A-5(1)	SM

[3] In all samples tested, 100 percent passed the No. 10 (2.0 millimeters) sieve.

[4] Based on the Unified Soil Classification System (*14*). SCS and Bureau of Public Roads have agreed to consider that all soils having plasticity indexes within two points from A-line are to be given a borderline classification. An example of a classification so obtained is ML-CL.

[5] Nonplastic.

[6] Insufficient amount of material for moisture and density tests.

TABLE 8.—*Estimated*

Soil series and map symbols	Depth from surface	Classification		
		Dominant USDA texture	Unified	AASHO
	In.			
Ashe: AsE, AsF, AsG.	0–14	Sandy loam	SM	A–2, A–4
	[1] 14–32	Loamy sand	SM	A–2
	32	Granite gneiss.		
Buncombe: Bu.	0–8	Loamy sand	SM	A–2
	[2] 8 60	Loamy sand	SM	A–2
Cataula:				
CaD3.	0–6	Clay loam	ML–CL, ML	A–6
	6–30	Clay loam or sandy clay loam	ML–CL, MH	A–7
	30–50	Fine sandy loam	SM, ML	A–4, A–5, A–7
CdB2, CdC2.	0–4	Sandy loam	SC, SM	A–2
	4–34	Clay loam or sandy clay loam	ML–CL, MH	A–7
	34–50	Fine sandy loam	SM, ML	A–4, A–5, A–7
Cecil:				
CeB3, CeC3.	0–5	Clay loam	ML	A–4
	5–45	Clay loam or clay	MH	A–7
	45–72	Sandy clay loam	ML	A–4
ClB2, ClC2, ClD2.	0–5	Sandy loam	SM	A–2
	5–54	Clay loam or clay	MH	A–7
	54–72	Sandy clay loam	ML	A–6
Chewacla: Cm, Co.	0–26	Loam, clay loam, or silty clay loam.	ML	A–4
	[2] 26 52	Silty clay loam	CL	A–6
Clifton: CtF.	0–6	Fine sandy loam	SM	A–4
	6–36	Clay loam and clay	CL–MH	A–7
	[1] 36–50	Sandy loam	SM	A–2
Edneyville: EdE, EdF, EdG.	0–7	Fine sandy loam	SM	A–2
	7–26	Sandy clay loam and sandy loam	SC	A–6
	26–40	Sandy loam	SM	A–2
Grover: GrB2, GrD2, GrE, GrF, GrG.	0–7	Fine sandy loam	SM	A 2, A–4
	7–28	Sandy clay loam	SC, MH, ML	A–6, A–7
	28–48	Sandy loam	SM, SC, ML	A–4, A–5, A–7
Gwinnett: GwF, GwG.	0–6	Sandy loam	SM	A–4
	6–20	Clay	MH	A–7
	20–30	Clay loam	MH	A–7
	30	Partly weathered rock.		
Hayesville: HeF, HeG.	0–7	Fine sandy loam	SM, SC	A–2, A–4, A–6
	7–26	Sandy clay loam and clay loam.	CL, SM	A–6, A–7
	26–34	Sandy clay loam	SC, CL	A–6, A–7
	34–60	Sandy loam	SM, CL	A–2, A–7
Helena: HlB.	0–6	Sandy loam	SM	A–4
	6–33	Clay	MH	A–7
	33–48	Sandy clay loam	SM	A–4

See footnotes at end of table.

properties of the soils

Mechanical analysis			Permeability	Available water capacity	Reaction	Shrink-swell potential
Percentage passing sieve—						
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 200 (0.074 mm.)				
			In./hr.	*In./in. of soil*	*pH*	
85–100	80–100	16–45	2. 0–6. 3	0. 10–0. 13	4. 5–5. 5	Low.
90–100	90–100	15–30	2. 0–6. 3	0. 05–0. 10	4. 5–5. 5	Low.
100	98–100	28–34	2. 0–6. 3	0. 05–0. 10	5. 5–6. 5	Low.
100	98–100	28–34	2. 0–6. 3	0. 05–0. 10	5. 5–6. 5	Low.
95–100	90–100	54–58	0. 20–0. 63	0. 12–0. 15	5. 1–6. 0	Low.
----------	100	50–69	0. 06 0. 20	0. 12–0. 15	5. 1–6. 0	Moderate.
----------	100	40–79	0. 63–2. 0	0. 10–0. 15	4. 5–5. 5	Low.
95–100	90–100	30–36	0. 63–2. 0	0. 08–0. 10	5. 1–6. 0	Low.
----------	100	50–69	0. 06–0. 20	0. 12–0. 15	5. 1–6. 0	Moderate.
----------	100	40–79	0. 63–2. 0	0. 10–0. 15	4. 5–5. 5	Low.
----------	100	52–58	0. 63–2. 0	0. 12–0. 15	5. 1–6. 0	Low.
----------	100	73–80	0. 63–2. 0	0. 12–0. 15	4. 5–6. 0	Moderate.
----------	100	51–56	0. 63–2. 0	0. 10–0. 13	4. 5–5. 5	Low.
100	96–100	25–30	2. 0–6. 3	0. 10–0. 13	5. 1–6. 0	Low.
----------	100	73–80	0. 63–2. 0	0. 12–0. 15	4. 5–6. 0	Moderate.
----------	100	52–58	0. 63–2. 0	0. 10–0. 13	4. 5–5. 5	Low.
----------	100	53–58	0. 63–2. 0	0. 10–0. 15	5. 1–6. 0	Low.
----------	100	58–63	0. 63–2. 0	0. 15–0. 18	5. 1–6. 0	Moderate.
----------	100	38–42	2. 0–6. 3	0. 10–0. 13	5. 1–6. 0	Low.
----------	100	70–80	0. 63–2. 0	0. 12–0. 15	5. 1–6. 0	Moderate.
----------	100	19–23	2. 0–6. 3	0. 10–0. 13	5. 1–6. 0	Low.
90–100	90–100	26–30	2. 0–6. 3	0. 10–0. 13	4. 5–5. 5	Low.
90–100	90–100	36–49	0. 63–2. 0	0. 10–0. 13	4. 5–5. 5	Low.
90–100	80–100	18–24	2. 0–6. 3	0. 10–0. 13	4. 5–5. 5	Low.
90–100	90–100	25–42	2. 0–6. 3	0. 10–0. 13	4. 5–6. 0	Low.
90–100	90–100	40–65	0. 63–2. 0	0. 10–0. 13	4. 5–6. 0	Low.
----------	100	36–60	2. 0–6. 3	0. 10–0. 13	4. 5–5. 5	Low.
85–100	80–100	40–45	0. 63–2. 0	0. 10–0. 13	5. 1–6. 0	Low.
90–100	90–100	65–73	0. 63–2. 0	0. 13–0. 15	5. 1–6. 0	Moderate.
80–100	70–100	64–68	0. 63–2. 0	0. 12–0. 15	5. 1–6. 0	Moderate.
90–100	90–100	30–50	2. 0–6. 3	0. 10–0. 13	4. 5–5. 5	Low.
90–100	90–100	38–70	0. 63–2. 0	0. 10–0. 13	4. 5–5. 5	Moderate.
90–100	90–100	40–70	0. 63–2. 0	0. 10–0. 13	4. 5–5. 5	Moderate.
70–100	60–100	25–65	0. 63–2. 0	0. 10–0. 13	4. 5–5. 5	Low.
90–100	90–100	36–42	0. 63–2. 0	0. 10–0. 13	4. 5–6. 0	Low.
----------	100	51–55	0. 20–0. 63	0. 12–0. 15	4. 5–5. 5	High.
90–100	90–100	36–42	0. 63–2. 0	0. 10–0. 13	4. 5–5. 5	Low.

TABLE 8.—*Estimated*

Soil series and map symbol	Depth from surface	Classification		
		Dominant USDA texture	Unified	AASHO
	In.			
Hiwassee:				
HwB2, HwC2, HwE2.	0–6	Sandy loam	SM, SC	A–2, A–4
	6–35	Sandy clay loam and clay	CL, MH, ML	A–6, A–7
	35–50	Clay loam	MH–CH, MH, CL	A–7
	50–60	Clay loam	CH, MH, CL	A–6, A–7
HyB2, HyC3, HyE3.	0–3	Clay loam	ML, CL	A–7
	3–35	Clay loam or clay	CL, MH, ML	A–7
	35–50	Clay or clay loam	MH–CH, MH, CL	A–7
	50–60	Clay loam	CL, CH, MH	A–6, A–7
Louisburg: LoE, LoF.	0–5	Sandy loam	SM	A–2
	5–13	Sandy loam	SM	A–2
	[1] 13–27	Sandy loam	SM	A–2
Madison:				
MaB2, MaC2, MaE2.	0–5	Sandy loam	SM, SC	A–4
	5–32	Clay loam or clay	SM, MH, CL	A–6, A–5, A–7
	32–42	Clay loam	SM	A–2, A–6, A–5
McE3.	42–48	Sandy loam	SM	A–2, A–4
	0–4	Clay loam	ML	A–6
	4–33	Clay loam or clay	MH, SM	A–6, A–5, A–7
	33–38	Sandy loam	SM	A–2, A–4
Musella: MuG.	0–6	Loam and silt loam	ML	A–4
	6–17	Clay loam	CL	A–6
	[1] 17–20	Sandy loam	SM	A–2
Pacolet:				
PaB2, PaC2, PaE2, PaF, PaG.	0–6	Fine sandy loam	SM	A–4
	6–24	Sandy clay loam or clay	MH	A–7
	24–32	Clay loam	MH	A–7
	32–40	Sandy loam	SM	A–2
PcC3, PcE3.	0–5	Clay loam	MH	A–7
	5–23	Clay loam or clay	MH	A–7
	23–29	Sandy loam	SM	A 2
Porters: PoF, PoG.	0–6	Loam	ML	A–4
	6–35	Clay loam	MH	A–7
	35–72	Fine sandy loam	SM	A–2
Rabun:				
RaF, RaG.	0–4	Cobbly loam	SM	A–4
	[1] 4–39	Clay	CL	A–6
RbE.	0–4	Loam	ML	A–4
	[1] 4–39	Clay	CL	A–7
	39	Weathered rock.		
Rock land: Ro. (Properties are variable.)				
Saluda: SaE, SaF, SaG.	0–6	Sandy loam	SM	A–2
	6–18	Sandy clay loam	CL	A–6
	[1] 18–38	Sandy loam	SM	A–2
Starr: SrB.	0–10	Loam	ML	A–4
	10–53	Clay loam	ML, CL	A–6
	53–70	Sandy loam	SM	A–2

See footnotes at end of table.

properties of the soils—Continued

Mechanical analysis			Permeability	Available water capacity	Reaction	Shrink-swell potential
Percentage passing sieve—						
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 200 (0.074 mm.)				
			In./hr.	*In./in. of soil*	*pH*	
98–100	94–100	28–49	2. 0–6. 3	0. 10–0. 13	5. 1–6. 5	Low.
98–100	96–100	55–75	0. 63–2. 0	0. 12–0. 15	5. 1–6. 0	Moderate.
98–100	97–100	55–75	0. 63–2. 0	0. 13–0. 15	5. 1–6. 0	Moderate.
98–100	96–100	55–75	0. 63–2. 0	0. 12–0. 15	5. 1–6. 0	Low.
----------	100	65–72	0. 20–0. 63	0. 12–0. 15	5. 1–6. 5	Moderate.
----------	100	55–75	0. 63–2. 0	0. 12–0. 15	5. 1 6. 0	Moderate.
100	97–100	55–75	0. 63–2. 0	0. 13–0. 15	5. 1–6. 0	Moderate.
98–100	96–100	55–75	0. 63–2. 0	0. 12–0. 15	5. 1–6. 0	Moderate.
100	94–97	28–32	2. 0–6. 3	0. 10–0. 13	4. 5–5. 5	Low.
100	96–98	28–34	2. 0–6. 3	0. 10–0. 13	4. 5–5. 5	Low.
100	96–98	24–29	2. 0–6. 3	0. 06–0. 09	4. 5–5. 5	Low.
90–100	80–100	36–40	2. 0–6. 3	0. 10–0. 13	5. 1–6. 5	Low.
95–100	90–100	45–60	0. 63–2. 0	0. 13–0. 15	5. 1–5. 5	Moderate.
95–100	90–100	30–45	0. 63–2. 0	0. 12–0. 15	5. 1–5. 5	Moderate.
90–100	80–100	20–40	2. 0–6. 3	0. 10–0. 13	5. 1–5. 5	Low.
90–100	90–100	52–56	0. 63–2. 0	0. 12–0. 15	5. 1–6. 5	Low.
95–100	90–100	45–60	0. 63–2. 0	0. 13–0. 15	5. 1–5. 5	Moderate.
90–100	80–100	20–45	2. 0–6. 3	0. 10–0. 13	5. 1–5. 5	Low.
80–100	80–100	55–60	0. 63–2. 0	0. 10–0. 15	5. 1–6. 5	Low.
80–100	80–100	50–79	0. 63–2. 0	0. 12–0. 15	5. 1–6. 0	Moderate.
50–100	50–98	28–34	2. 0–6. 3	0. 08–0. 10	5. 1–6. 0	Low.
----------	100	24–30	2. 0–6. 3	0. 10–0. 15	4. 5–5. 5	Low.
----------	100	51–58	0. 63–2. 0	0. 13–0. 15	4. 5–5. 5	Moderate.
----------	100	51–55	0. 63–2. 0	0. 12–0. 15	4. 5–5. 5	Low.
----------	100	28–33	2. 0–6. 3	0. 08–0. 10	4. 5–5. 5	Low.
----------	100	51–56	0. 63–2. 0	0. 12–0. 15	4. 5–5. 5	Low.
----------	100	51–56	0. 63–2. 0	0. 13–0. 15	4. 5–5. 5	Moderate.
----------	100	28–33	2. 0–6. 3	0. 08–0. 10	4. 5–5. 5	Low.
----------	100	55–60	2. 0–6. 3	0. 10–0. 15	5. 1–6. 0	Low.
----------	100	72–78	0. 63–2. 0	0. 12–0. 15	5. 1–6. 0	Moderate.
----------	100	23–28	2. 0–6. 3	0. 10–0. 15	5. 1–6. 0	Low.
50–80	45–75	36–45	2. 0–6. 3	0. 10–0. 12	4. 5–5. 5	Low.
50–80	50–80	50–70	0. 63–2. 0	0. 10–0. 13	5. 1–6. 0	Moderate.
90–100	90–100	51–54	2. 0–6. 3	0. 10–0. 15	4. 5–5. 5	Low.
90–100	90–100	72–78	0. 63–2. 0	0. 13–0. 15	5. 1–6. 0	Moderate.
96–100	94–98	28–32	0. 63–2. 0	0. 08–0. 10	4. 5–5. 5	Low.
94–100	80–98	51–55	0. 63–2. 0	0. 10–0. 13	4. 5–5. 5	Low.
90–100	80–98	28–32	0. 63–2. 0	0. 08–0. 10	4. 5–5. 5	Low.
80–100	80–100	51–56	0. 63–2. 0	0. 10–0. 15	5. 1–6. 0	Low.
80–100	80–100	57–64	0. 63–2. 0	0. 12–0. 15	5. 1–6. 0	Low.
65–95	60–90	28–33	0. 63–2. 0	0. 08 0. 10	5. 1–6. 0	Low.

TABLE 8.—*Estimated*

Soil series and map symbols	Depth from surface	Classification		
		Dominant USDA texture	Unified	AASHO
	In.			
Stony land: St. (Properties are variable.)				
Tallapoosa: TaD, TaE, TaF, TaG.	0–7	Loam	ML	A–4
	7–16	Sandy clay loam	ML	A–6
	[1] 16–40	Sandy loam	SM	A–4
Toccoa: To.	0–11	Sandy loam	SM	A–4
	[2] 11–64	Fine sandy loam and very fine sandy loam.	SM	A–4
Tusquitee: TuC.	0–8	Loam	ML	A–4
	8–16	Loam	ML	A–4
	[1] 16–52	Clay loam	ML	A–6
Worsham: WoB.	0–9	Sandy loam	SM	A–2, A–4
	9–31	Sandy clay loam and sandy clay	SC	A–7, A–6
	[2] 31–44	Clay loam	CL	A–6

[1] Bedrock occurs within this layer in places.
[2] Seasonally high water table.

TABLE 9.—*Engineering*

Soil series and map symbols	Suitability as a source of—		Degree of limitation for—	
	Topsoil	Road fill	Septic tank filter fields	Sewage lagoons
Ashe: AsE, AsF, AsG	Poor: low productivity; less than 6 inches of suitable material.	Fair: 2 feet to rock	Severe: 2 feet to rock; slope.	Severe: moderately rapid permeability; 2 feet to rock; slope.
Buncombe: Bu	Poor: low productivity.	Good	Severe: very frequent flooding.	Severe: moderately rapid permeability.
Cataula:				
CdB2	Poor: about 5 inches of suitable material.	Poor: poor traffic-supporting capacity.	Severe: slow permeability.	Moderate: slope
CaD3, CdC2	Poor: about 5 inches of suitable material.	Poor: poor traffic-supporting capacity.	Severe: slow permeability; slope	Severe: slope

properties of the soils—Continued

Mechanical analysis			Permeability	Available water capacity	Reaction	Shrink-swell potential
Percentage passing sieve—						
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 200 (0.074 mm.)				
			In./hr.	*In./in. of soil*	*pH*	
80–100	80–100	55–65	0. 63–2. 0	0. 10–0. 15	4. 5–5. 5	Low.
80–100	80–100	65–75	0. 63–2. 0	0. 10–0. 13	4. 5–5. 5	Low.
80–100	80–100	38–42	2. 0–6. 3	0. 08–0. 10	4. 5–5. 5	Low.
----------	100	38–42	2. 0–6. 3	0. 10–0. 13	5. 6–6. 5	Low.
----------	100	38–42	0. 63–2. 0	0. 10–0. 13	5. 6–6. 5	Low.
80–100	75–98	51–55	2. 0–6. 3	0. 10–0. 15	5. 1–6. 0	Low.
90–100	85–100	51–55	2. 0–6. 3	0. 10–0. 15	5. 1–6. 0	Low.
90–100	90–100	55–62	2. 0–6. 3	0. 12–0. 15	5. 1–6. 0	Low.
95–100	92–100	30–49	2. 0–6. 3	0. 08–0. 10	4. 4–5. 5	Low.
95–100	91–100	41–46	0. 20–0. 63	0. 10–0. 13	4. 4–5. 5	Moderate.
95–100	91–100	51–55	0. 20–0. 63	0. 12–0. 15	4. 4–5. 5	Low.

interpretations

Soil features affecting—					
Highway location	Farm ponds		Irrigation	Terraces and diversions	Waterways
	Reservoir areas	Embankments			
Rock at a depth of 2 feet; slope.	Moderately rapid permeability.	Poor resistance to piping and erosion; fair slope stability.	Soils are moderately steep to very steep.	Soils are moderately steep to very steep.	Soils are moderately steep to very steep.
Very frequent flooding.	Moderately rapid permeability.	Poor resistance to piping and erosion; fair slope stability.	Moderately rapid permeability; low available water capacity.	Nearly level soil-----	Sandy throughout; low inherent fertility; low available water capacity.
Severe inherent erodibility; poor traffic-supporting capacity.	Soil features favorable.	Fair slope stability; medium to high compressibility.	Slow permeability---	Dense clay loam or sandy clay loam subsoil; construction is difficult.	Very severe inherent erodibility.
Severe inherent erodibility; poor traffic-supporting capacity.	Sloping to strongly sloping soils.	Fair slope stability; medium to high compressibility.	Slow permeability---	Dense clay loam or sandy clay loam subsoil; construction is difficult.	Very severe inherent erodibility; sloping to strongly sloping soils.

TABLE 9.—*Engineering*

Soil series and map symbols	Suitability as a source of—		Degree of limitation for—	
	Topsoil	Road fill	Septic tank filter fields	Sewage lagoons
Cecil:				
CeB3, ClB2	Poor: about 5 inches of suitable material.	Poor: poor traffic-supporting capacity.	Moderate: moderate permeability; slope.	Moderate: moderate permeability; slope.
CeC3, ClC2	Poor: about 5 inches of suitable material.	Poor: poor traffic-supporting capacity.	Moderate: moderate permeability; slope.	Severe: slope
ClD2	Poor: about 5 inches of suitable material.	Poor: poor traffic-supporting capacity.	Severe: slope	Severe: slope
Chewacla: Cm, Co	Fair: texture is variable.	Fair: fair traffic-supporting capacity; moderate shrink-swell potential.	Severe: seasonally high water table; frequent flooding.	Severe: occasional to frequent flooding; high water table.
Clifton: CtF	Fair: about 6 inches of suitable material.	Fair: 2 to 5 feet to rock.	Severe: 2 to 5 feet to rock; slope.	Severe: 2 to 5 feet to rock; slope.
Edneyville: EdE, EdF, EdG	Fair: about 7 inches of good material.	Fair: 2 to 20 feet to rock.	Severe: 2 to 20 feet to rock; slope.	Severe: slope
Grover:				
GrB2	Fair: about 7 inches of good material.	Fair: fair traffic-supporting capacity; micaceous.	Moderate to severe: moderate permeability; slope is 2 to 6 percent.	Moderate: moderate permeability; slope.
GrD2, GrE, GrF, GrG	Fair: about 7 inches of good material.	Fair: fair traffic-supporting capacity; micaceous.	Severe: slope	Severe: slope
Gwinnett: GwF, GwG	Poor to fair: about 6 inches of suitable material.	Poor: poor traffic-supporting capacity	Severe: moderately slow permeability; slope.	Severe: slope
Hayesville: HeF, HeG	Fair: about 7 inches of good material.	Fair: fair traffic-supporting capacity.	Severe: slope	Severe: slope
Helena: HlB	Fair: about 6 inches of good material.	Poor: poor traffic-supporting capacity.	Severe: moderately slow permeability.	Moderate: slope

interpretations—Continued

Soil features affecting—					
Highway location	Farm ponds		Irrigation	Terraces and diversions	Waterways
	Reservoir areas	Embankments			
Severe inherent erodibility; poor traffic-supporting capacity.	Moderate permeability.	Fair slope stability; medium to high compressibility.	Moderate permeability; medium available water capacity.	Clay loam or clay subsoil; construction is difficult.	Severe inherent erodibility.
Severe inherent erodibility; poor traffic-supporting capacity.	Moderate permeability; sloping soils.	Fair slope stability; medium to high compressibility.	Moderate permeability; medium available water capacity.	Clay loam or clay subsoil; construction is difficult.	Severe inherent erodibility.
Severe inherent erodibility; poor traffic-supporting capacity.	Moderate permeability; strongly sloping soil.	Fair slope stability; medium to high compressibility.	Strongly sloping soil.	Strongly sloping soil.	Severe inherent erodibility; strongly sloping soil.
High water table; occasional to frequent flooding; moderate shrink-swell potential; fair traffic-supporting capacity.	Moderate permeability.	Poor to good resistance to piping and erosion; medium compressibility; fair to good slope stability.	High water table; moderate infiltration and permeability.	Nearly level soils on flood plains.	Nearly level soils; somewhat poorly drained.
Severe inherent erodibility; 2 to 5 feet to rock; slope.	Moderately rapid permeability at a depth below 36 inches; moderately steep to steep soil.	Medium to high compressibility; poor to good resistance to piping and erosion.	Moderately steep to steep soil.	Moderately steep to steep soil.	Moderately steep to steep soil.
Severe inherent erodibility; 2 to 20 feet to rock; slope.	Moderate permeability; strongly sloping to very steep soils.	Good to poor resistance to piping and erosion; bedrock at a depth of 2 feet in places.	Strongly sloping to very steep soils.	Strongly sloping to very steep soils.	Strongly sloping to very steep soils.
Severe inherent erodibility; fair traffic-supporting capacity.	Moderate permeability.	Medium to high compressibility; poor to good resistance to piping and erosion; micaceous.	Infiltration and permeability are moderate.	Loamy, friable soil to a depth of 30 inches.	Severe inherent erodibility.
Severe inherent erodibility; slope; fair traffic-supporting capacity.	Moderate permeability; sloping to very steep soils.	Medium to high compressibility; poor to good resistance to piping and erosion; micaceous.	Sloping to very steep soils.	Sloping to very steep soils.	Severe inherent erodibility; sloping to very steep soils.
Severe inherent erodibility; poor traffic-supporting capacity; slope.	Steep to very steep soils.	High compressibility; fair slope stability.	Steep to very steep soils.	Steep to very steep soils.	Steep to very steep soils.
Severe inherent erodibility; slope.	Moderate permeability; moderately steep to very steep soils.	Poor to good resistance to piping and erosion.	Moderately steep to very steep soils.	Moderately steep to very steep soils.	Moderately steep to very steep soils.
Severe inherent erodibility; poor traffic-supporting capacity.	Soil features favorable.	High compressibility; fair slope stability.	Moderately slow permeability.	Soil is on lower slopes, on toe slopes, or in depressions.	Moderately well drained; clayey subsoil.

TABLE 9.—*Engineering*

Soil series and map symbols	Suitability as a source of—		Degree of limitation for—	
	Topsoil	Road fill	Septic tank filter fields	Sewage lagoons
Hiwassee: HyB2, HwB2	Poor to fair: about 6 inches of good material.	Poor: poor traffic-supporting capacity.	Moderate: moderate permeability.	Moderate: slope; moderate permeability.
HwC2, HyC3, HwE2, HyE3	Poor to fair: about 6 inches of good material.	Poor: poor traffic-supporting capacity.	Moderate: moderate permeability. Severe where slope is more than 10 percent.	Severe: slope
Louisburg: LoE, LoF	Poor: low productivity.	Fair: 2 to 10 feet to rock.	Severe: slope	Severe: moderately rapid permeability; 2 to 10 feet to rock; slope.
Madison: MaB2	Poor: about 5 inches of good material.	Poor: poor traffic-supporting capacity; micaceous.	Moderate: moderate permeability.	Moderate: moderate permeability; slope.
MaC2	Poor: about 5 inches of good material.	Poor: poor traffic-supporting capacity; micaceous.	Moderate: moderate permeability; slope.	Severe: slope
MaE2, McE3	Poor: about 5 inches of good material.	Poor: poor traffic-supporting capacity; micaceous.	Severe: slope	Severe: slope
Musella: MuG	Poor: about 6 inches or less of good material; low productivity.	Poor: 1 to 2 feet to rock.	Severe: 1 to 2 feet to rock; slope.	Severe: 1 to 2 feet to rock; slope.
Pacolet: PaB2	Fair: about 6 inches of good material.	Poor to fair: poor to fair traffic-supporting capacity.	Moderate: moderate permeability.	Moderate: moderate permeability; slope.
PaC2, PaE2, PaF, PaG, PcC3, PcE3.	Fair: about 6 inches of good material.	Poor to fair: poor to fair traffic-supporting capacity.	Moderate: 6 to 10 percent slopes. Severe where slope is more than 10 percent.	Severe: slope
Porters: PoF, PoG	Fair: about 6 inches of good material.	Poor: poor traffic-supporting capacity.	Severe: slope	Severe: slope
Rabun: RaF, RaG, RbE	Poor: about 4 inches of good material.	Fair: 3 to 5 feet to to rock.	Severe: slope	Severe: slope
Rock land: Ro. (Properties are variable.)				

interpretations—Continued

Soil features affecting—					
Highway location	Farm ponds		Irrigation	Terraces and diversions	Waterways
	Reservoir areas	Embankments			
Severe inherent erodibility; poor traffic-supporting capacity.	Moderate permeability.	Medium to high compressibility; fair to good slope stability.	Infiltration and permeability are moderate.	Clay loam or clay subsoil; construction is difficult.	Severe inherent erodibility.
Severe inherent erodibility; some slopes are more than 10 percent; poor traffic-supporting capacity.	Sloping to moderately steep soils.	Medium to high compressibility; fair to good slope stability.	Infiltration and permeability are moderate; sloping to moderately steep soils.	Clay loam or clay subsoil; sloping to moderately steep soils.	Severe inherent erodibility; sloping to moderately steep soils.
Severe inherent erodibility; 2 to 10 feet to rock; slope.	Moderately rapid permeability; strongly sloping to steep soils.	Poor resistance to piping and erosion; 2 to 10 feet to rock.	Strongly sloping to steep soils; low available water capacity.	Strongly sloping to steep soils.	Strongly sloping to steep soils.
Severe inherent erodibility; poor traffic-supporting capacity.	Moderate permeability.	High compressibility; fair slope stability.	Infiltration and permeability are moderate.	Clay loam or clay subsoil; construction is difficult.	Severe inherent erodibility.
Severe inherent erodibility; poor traffic-supporting capacity.	Moderate permeability.	High compressibility; fair slope stability.	Infiltration and permeability are moderate.	Clay loam or clay subsoil; construction is difficult.	Severe inherent erodibility.
Severe inherent erodibility; poor traffic-supporting capacity; slope.	Strongly sloping to moderately steep soils; moderate permeability.	High compressibility; fair slope stability.	Strongly sloping to moderately steep soils.	Strongly sloping to moderately steep soils.	Strongly sloping to moderately steep soils.
Rock at a depth of 1 to 2 feet; slope.	Moderate permeability; very steep soil.	Medium compressibility; 1 to 2 feet to rock.	Very steep soil	Very steep soil	Very steep soil.
Severe inherent erodibility; poor to fair traffic-supporting capacity.	Moderate permeability.	High compressibility; fair slope stability.	Infiltration and permeability are moderate.	Clay loam or clay subsoil; construction is difficult.	Severe inherent erodibility.
Severe inherent erodibility; poor to fair traffic-supporting capacity; slope.	Moderate permeability; sloping to very steep soils.	High compressibility; fair slope stability.	Infiltration and permeability are moderate; sloping to very steep soils.	Clay loam or clay subsoil; sloping to very steep soils.	Severe inherent erodibility; sloping to very steep soils.
Poor traffic-supporting capacity; slope.	Moderate permeability; moderately steep to very steep soils.	High compressibility; fair slope stability.	Moderately steep to very steep soils.	Moderately steep to very steep soils.	Moderately steep to very steep soils.
Rock at a depth of 3 to 5 feet; fair traffic-supporting capacity; severe inherent erodibility; slope.	Moderate permeability; strongly sloping to very steep soils.	Material stony or cobbly in places; limited borrow material.	Strongly sloping to very steep soils.	Strongly sloping to very steep, cobbly soils.	Strongly sloping to very steep, cobbly soils.

TABLE 9.—*Engineering*

Soil series and map symbols	Suitability as a source of—		Degree of limitations for—	
	Topsoil	Road fill	Septic tank filter fields	Sewage lagoons
Saluda: SaE, SaF, SaG	Fair to poor: about 4 to 8 inches of good material.	Fair: 3 to 10 feet to rock.	Severe: slope	Severe: slope
Starr: SrB	Fair: about 10 inches of good material.	Fair: fair traffic-supporting capacity.	Slight to moderate: moderate permeability; infrequent flooding.	Moderate: moderate permeability; slope.
Stony land: St (Properties are variable.)				
Tallapoosa: TaD, TaE, TaF, TaG	Fair: about 7 inches of good material.	Poor: 20 to 40 inches to rock; micaceous.	Severe: 20 to 40 inches to rock; slope.	Severe: 20 to 40 inches to rock; slope.
Toccoa: To	Good	Good	Severe: frequent flooding.	Moderate: moderate permeability.
Tusquitee: TuC	Fair: about 16 inches of good material.	Fair: fair traffic-supporting capacity.	Moderate: slope	Severe: slope
Worsham: WoB	Poor: low productivity.	Poor: poorly drained	Severe: moderately slow permeability; high water table.	Moderate: slope

Engineering classification systems

Most highway engineers classify soil materials according to the system used by the American Association of State Highway Officials (AASHO) (*1*). In this system soil materials are classified into seven principal groups. The groups range from A–1 through A–7. The best materials for engineering purposes (gravelly soils of high bearing capacity) are classified as A–1, and the poorest (clayey soils having low strength when wet) are classified as A–7. Within each group, the relative engineering value of the soils is indicated by a group index number. Group indexes range from 0 for the best material to 20 for the poorest. The group index number is shown in parentheses following the group symbol. The group index numbers can be established only by laboratory tests.

Some engineers prefer to use the Unified classification system (*14*), which was developed by the Department of Defense. In this system, soil materials are identified as coarse grained (eight classes), fine grained (six classes), or highly organic, and symbols are used to identify each group.

The U.S. Department of Agriculture system of classifying soils according to texture is primarily for agricultural use, but the textural classification is useful in engineering also. In this system, soils are classified according to the proportional amounts of different sizes of mineral particles. A soil that is at least 40 percent clay particles, for example, is called clay. Beginning with the largest, the particle sizes are designated as cobblestones, gravel, sand, silt, and clay.

Engineering test data

Table 7 gives data from sampling of four extensive soil series and two moderately extensive series of the county. Samples were tested by standard procedures. The data may not be adequate for estimating the characteristics of soil materials in very deep cuts, because samples were taken only to a depth of less than 5 feet.

The data given in table 7 were obtained by mechanical analyses and by tests to determine liquid limits and the plastic limits. Mechanical analyses were made by the combined sieve and hydrometer methods.

Tests for plastic limit and liquid limit measure the effect of water on the consistence of soil material. As the moisture content of clayey soil increases, the material changes from a semisolid to a plastic state. If the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material passes from a semisolid to a plastic state (*7*). The liquid limit is the moisture content

interpretations—Continued

Soil features affecting—					
Highway location	Farm ponds		Irrigation	Terraces and diversions	Waterways
	Reservoir areas	Embankments			
Rock at a depth of 3 to 10 feet; severe inherent erodibility; slope.	Moderate permeability; strongly sloping to very steep soils.	Poor to good resistance to piping and erosion.	Strongly sloping to very steep soils.	Strongly sloping to very steep soils.	Strongly sloping to very steep soils.
Fair traffic-supporting capacity.	Moderate permeability.	Poor resistance to piping and erosion; fair slope stability.	Infiltration and permeability are moderate; medium available water capacity.	Soil is in depressions or near heads of drainageways.	Loamy, friable soil; moderate inherent fertility.
Severe inherent erodibility; 20 to 40 inches to rock; micaceous; slope.	Moderate permeability; sloping to very steep soils.	Poor resistance to piping and erosion; micaceous; fair slope stability.	Strongly sloping to very steep soils.	Strongly sloping to very steep soils.	Strongly sloping to very steep soils.
Moderately high water table; frequent flooding.	Moderate permeability.	Poor resistance to piping and erosion; fair slope stability.	Soil features favorable.	Nearly level soil on flood plains.	Loamy or sandy, nearly level soil; moderate inherent fertility.
Fair traffic-supporting capacity.	Moderately rapid permeability.	Poor resistance to piping and erosion; fair slope stability.	Infiltration is moderately rapid; permeability is moderate.	Soil is in mountain coves on toe slopes.	Loamy, friable, gently sloping to sloping soil; moderate inherent fertility.
Poorly drained: high water table.	Soil features favorable.	Generally well suited.	Moderately slow permeability.	Long, narrow areas near heads of drainageways; slope.	Poorly drained.

at which the material passes from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is in a plastic state.

Table 7 also gives compaction (moisture-density) data for the tested soils. If the soil material is compacted at a successively higher moisture content and the compactive effort remains constant, the density of the compacted material increases until the optimum moisture content is reached. After that, the density decreases as the moisture content increases. The highest dry density obtained in the compaction test is termed maximum dry density. Moisture-density data are important in planning earthwork, because generally the soil is most stable if it is compacted to about its maximum dry density when it is at approximately the optimum moisture content.

A dual classification, such as ML–CL, is used under the Unified classification system to indicate a soil that has characteristics of two groups.

Engineering properties of the soils

Table 8 lists all the soils of the county and gives estimates of their physical and chemical properties. The soils are described by layers that have properties significant in engineering. The texture of each layer is listed according to the textural classification of the United States Department of Agriculture (*12*).

The seasonally high water table was not rated. In most of the soils, the water table is deep. Soils along the flood plains of the streams have a high water table where adequate drainage has not been installed.

The approximate depth to bedrock has a considerable range for most soils. Bedrock is below 5 feet for all soils of the county except the following: Musella soils have broken rock within 20 inches of the surface. Tallapoosa soils have broken rock within 20 to 40 inches. Porters and Rabun soils have hard rock within 3 to 5 feet. Ashe, Clifton, Edneyville, and Louisburg soils have bedrock within 2 feet to more than 5 feet, and Saluda soils have bedrock within 3 feet to more than 5 feet.

Permeability is estimated for each layer on the basis of soil structure without compaction. It refers to the rate at which water moves through the soil material and depends largely on the texture of the soil (*11*).

Available water capacity is the capacity of the soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point.

It is commonly expressed as inches of water per inch of soil.

Reaction is shown in terms of pH values. A pH value less than 7.0 indicates that the soil is acid; values more than pH 7.0 indicate that the soil is alkaline. An extremely acid or alkaline reaction can have an important effect on structures or on treatments for soil stabilization.

The rating for shrink-swell potential indicates how much a soil changes in volume when it is subject to changes in moisture content. In general, soils that have a high clay content, such as those classified MH and A–7, as shown in table 8, have a moderate shrink-swell potential.

Engineering interpretations

In this section the suitability of the soils for highway, sanitary, and conservation engineering is discussed in relation to the soil properties that affect construction of highways and other engineering structures. More detailed ratings are given in table 9.

The factors considered in relation to highway engineering were the suitability of the soil as a source of top soil and road fill and as a location for highways.

The main factors considered in rating the soil as a source of topsoil were the ability of the soil to support vegetation, the thickness of the surface layer, and the presence of rock or coarse fragments. Since the surface layer of all soils rated was less than 20 inches thick, none of the soils were rated good.

Ratings for road fill were based on the use of the soils as an embankment to support the subbase, a base course, or a surface course. Shear strength, shrink-swell potential, compaction, workability, moisture content, and depth to the water table and to rock were the factors considered.

The soils were not rated as a source of sand or gravel. Sand is obtained locally from the streams, but it is generally poorly graded. The gravel used from a local source is crushed rock.

The factors considered for highway location were those soil features that affect performance of the soils when used for highways. The main factors were slope, traffic-supporting capacity, depth to the water table, erodibility of soil material, depth to rock, and flooding. These factors were considered for the entire soil profile in an undisturbed state.

In sanitary engineering, the degree of limitation of the soils when used as septic tank filter fields and as sewage lagoons was considered. The principal reasons for assigning moderate or severe limitations are given in the table. Soil features affecting these uses are permeability, height of the water table, susceptibility to flooding, and slope.

The conservation uses of the soil considered include the construction of ponds, terraces, diversions, grassed waterways, and drainage systems. The suitability of the soil for irrigation was also considered. These are the main conservation engineering uses in the county.

Many sites in the county are suitable for ponds. Many ponds have been built, and they are a major source of water for fishing and watering livestock. Necessary in constructing a pond are: (1) selecting a site where a maximum amount of water can be impounded at minimum cost; (2) preventing excessive seepage under or through the dam or along the abutments; (3) providing adequate fill material to build a stable embankment; (4) providing spillways adequate to carry off storm water; and (5) stabilizing embankments and emergency spillways by establishing suitable vegetation.

Most of the soils on the flood plains of the rivers and creeks have a high water table or are subject to overflow, or both. For favorable crop production, most areas of these soils need some kind of surface or subsurface drainage. The method depends on land use, availability of outlets, and soil permeability. Open drains or tile drains, or a combination of both, are suitable.

Soils of the Chewacla and Worsham series are the only soils that need internal drainage for farming. If flooding is controlled and if adequate outlets are available, Chewacla soils can be drained by open ditches or by tile. Worsham soils are moderately slowly permeable and are poorly suited to tile drainage.

In places land smoothing is desirable for drainage. This practice is also used on soils to be terraced, to permit better row drainage and terrace alinement.

Most cultivated areas of the county need a complete water disposal system to control erosion. Such a system consists of one or all of the following: (1) diversions, (2) terraces, and (3) grassed waterways. Diversions are used to divert water from higher areas to sites where it can be used or disposed of safely. In cultivated areas where the slope range is 2 to 10 percent, terraces reduce erosion damage by intercepting surface runoff and conducting it to a stable outlet. It is not feasible to build terraces where the slope is less than 2 percent or more than 10 percent. The spacing between terraces depends on the percentage of slope. Various grades are used on irregular slopes to improve terrace alinement and spacing because crooked and unevenly spaced terraces make cultivation difficult. Waterways constructed in natural draws serve as outlets for diversions and terraces. The deepening and widening of shallow depressions may be required to provide adequate depth and capacity for drainage from rows and terraces. The natural draws and depressions should be seeded or sodded to suitable vegetation.

Sprinkler systems are adequate for supplying the small amount of irrigation water needed in Pickens County.

Use of the Soils for Town and Country Planning

Table 10 gives ratings of the soils when they are used as campsites, playgrounds, fairways for golf courses, picnic areas, sites or low buildings and light industry, and trafficways. The main limitations are given for all soils except those that have a rating of slight. A rating of slight means that the soils have few or no limitations, or that the limitations can be easily overcome. A rating of moderate indicates that the limitations should be recognized, but that they can be overcome by practical means. A rating of severe indicates that the limitations are difficult to overcome and, for this reason, suitability of the soil for the specified use is questionable.

The following paragraphs discuss some of the factors considered in preparing the ratings for the specified use.

Recreational sites.—The chief factors that limit the use of soils for recreational sites are slope, trafficability, erodibility, permeability, productivity, height of the water table, flooding, drainage, and depth to rock. Limitations are rated for campsites, playgrounds, golf fairways, and picnic areas.

Sites for low buildings and light industry.—These are sites for buildings of three stories or less. Public or community facilities for sewage disposal are assumed to be available. The factors considered in rating the soils are bearing capacity, slope, height of the water table, hazard of flooding, and depth to rock.

Trafficways.—Trafficways are streets in residential areas and roads that can be built at low cost. Required in construction are only small cuts and fills and little preparation of subgrade. Factors used in rating the soils are slope, depth to rock, height of the water table, hazard of flooding, erodibility, and traffic-supporting capacity.

Formation and Classification of the Soils

The first part of this section tells how the soils of Pickens County formed and discusses the primary factors that control soil formation. The second explains the current system of soil classification and discusses the comprehensive Soil Classification System. Table 11 shows the classification of the soil series of Pickens County by families, subgroups, and orders.

Factors of Soil Formation

Soil is the product of the action, through time, of living organisms and climate on parent material. The action is conditioned by relief. Each of these factors is affected by the others.

In some soils, one or two of the soil-forming factors are dominant and have determined most of the characteristics of the soil. In others, each of the factors has contributed significantly to the present characteristics of the soil.

Soils are continually changing in a process of formation. Forces are constantly at work in the development of horizons. Other forces are constantly mixing the soil material. These forces are slow and minute, but they are decisive in forming soil from parent material. The five primary soil-forming factors are discussed in the following paragraphs.

Parent material

Parent material is the unconsolidated mass from which a soil is developed. In this county about 94 percent of the parent material is weathered granite, schist, and gneiss, with injections of basic rocks, such as hornblende gneiss and diorite. About 6 percent of the parent material is alluvial-colluvial depositions, mainly along the flood plains of the streams.

The granite rocks contain large amounts of quartz, are very hard, and weather very slowly. The very steep soils are generally weakly developed and are shallow. Soils of the Ashe series are examples. The schist rocks are highly micaceous, and they are relatively soft and weathered to a depth of several feet. The gneiss rocks are not so hard and dense as the granite rocks, and they weather more readily. The granite and gneiss rocks generally are acidic; most soils formed from them are strongly acid and generally have a surface layer of sandy loam. Soils of the Cecil series are examples of deep soils formed in material weathered from granite and gneiss.

The hornblende gneiss and diorite rocks contain less quartz than the granitic rocks and are less acidic. They weather at a moderate rate. Soils formed from these rocks generally have a surface layer of loam to fine sandy loam.

Soils formed in residuum from these rocks have morphological, chemical, and textural characteristics related to the rocks.

The soils along the flood plains of the streams formed in alluvial-colluvial deposits that washed from upland soils within the drainage area. These are very young soils that have little or no horizon development and generally are still receiving deposition. Soils of the Toccoa series are examples of soils formed in alluvium. Some of the soils formed in old alluvium on high stream terraces. They have strong horizon development.

Climate

Climate, particularly precipitation and temperature, affects the physical, chemical, and biological relationships in the soil. Water dissolves minerals, aids chemical and biological activity, and transports dissolved minerals and organic residue through the soil. The amount of water that percolates through the soil depends on the amount of rainfall, the length of time the soil is not frozen, the infiltration and permeability rates, and the slope and physiographic position. Temperature influences the kinds and rate of growth of living organisms and the speed of physical and chemical reactions in the soil.

Pickens County has a mild temperate climate that is typical of the southeastern part of the United States.

The Blue Ridge Mountains occupy about 14 percent of the county, mostly in the northern and northwestern parts. In this part of the county, rainfall is more abundant and average temperatures are lower than in the rest of the county. The difference is great enough that the natural vegetation is slightly different, and soils show some slight differences. Generally, soils in this cooler mountainous area have a thicker and darker A1 horizon than soils in other parts of the county.

The net effect of climate on soil development in Pickens County has been to cause similarities, even in soils developed in different parent materials. As expected in high rainfall and warm temperate climates, most of the soils are highly leached, strongly acid, and low in fertility and base saturation and they have well-developed horizons. This leveling effect of climate has not been enough to overcome the youth of the soils developed in alluvium or the youth and relief of some of the steeper soils, such as those of the Ashe series.

Relief

Relief is the lay of the land. It is largely determined by the kind of bedrock formations, the geologic history of the area, and the effects of dissection by streams. It influences soil formation by its effect on moisture, temperature, erosion, and plant cover. In this county, some areas have long, very steep slopes and some areas are level.

The slope ranges from 0 to 90 percent. Bedrock commonly is granite, schist, or gneiss. Indications are that there have been uplifts, faults, and intrusions of this bedrock. The county is well dissected by many branching drainageways. Level soils may be saturated with water for long periods. Very steep soils commonly lose soil material to erosion by creep, slide, or surface runoff to such an extent that horizon development is weak.

TABLE 10.—*Limitations of the soils*

[Interpretations were not made for Rock land and Stony land, because the

Soil series and map symbols	Recreational	
	Campsites	Playgrounds
Ashe: AsE, AsF, AsG	Moderate: slope is 10 to 15 percent. Severe: slope is 15 to 90 percent.	Severe: slope
Buncombe: Bu	Severe: very frequent flooding	Severe: very frequent flooding
Cataula: CaD3	Moderate: slow permeability; slope; poor trafficability.	Severe: slope
CdB2, CdC2	Moderate: slow permeability; slope	Moderate: slow permeability; slope is 2 to 6 percent. Severe: slope is more than 6 percent.
Cecil: CeB3, CeC3	Moderate: poor trafficability	Moderate: slope is 2 to 6 percent. Severe: slope is more than 6 percent.
ClB2, ClC2, ClD2	Slight: slope is less than 8 percent. Moderate: slope is 8 to 15 percent.	Moderate: slope is 2 to 6 percent. Severe: slope is more than 6 percent.
Chewacla: Cm, Co	Severe: occasional to frequent flooding	Severe: occasional to frequent flooding
Clifton: CtF	Severe: slope	Severe: slope
Edneyville: EdE, EdF, EdG	Moderate: slope is 10 to 15 percent. Severe: slope is more than 15 percent.	Severe: slope
Grover: GrB2, GrD2, GrE, GrF, GrG	Slight: slope is less than 8 percent. Moderate: slope is 8 to 15 percent. Severe: slope is more than 15 percent.	Moderate: slope is 2 to 6 percent. Severe: slope is more than 6 percent.
Gwinnett: GwF, GwG	Severe: slope	Severe: slope
Hayesville: HeF, HeG	Severe: slope	Severe: slope
Helena: HlB	Moderate: moderately slow permeability; moderately well drained.	Moderate: slope; moderately slow permeability; moderately well drained.
Hiwassee: HwB2, HwC2, HwE2	Slight: slope is 2 to 8 percent. Moderate: slope is 8 to 15 percent. Severe: slope is more than 15 percent.	Moderate: slope is 2 to 6 percent. Severe: slope is more than 6 percent.
HyB2, HyC3, HyE3	Moderate: slope is less than 15 percent; poor trafficability. Severe: slope is more than 15 percent.	Moderate: poor trafficability; slope is 2 to 6 percent. Severe: slope is more than 6 percent.

See footnote at end of table.

for town and country planning

soil material is too variable for reliable evaluation]

sites		Sites for low buildings and light industry [1]	Trafficways
Golf fairways	Picnic areas		
Severe: slope; low productivity.	Moderate: slope is 10 to 15 percent. Severe: slope is more than 15 percent.	Severe: slope; 2 feet to rock	Severe: 2 feet to rock.
Severe: very frequent flooding.	Moderate: very frequent flooding.	Severe: very frequent flooding	Severe: very frequent flooding.
Severe: slope	Moderate: slope; poor trafficability.	Moderate: slope; low bearing capacity.	Severe: poor traffic-supporting capacity; severe inherent erodibility.
Slight: slope is 2 to 6 percent. Moderate: slope is 6 to 10 percent.	Slight: slope is less than 8 percent. Moderate: slope is more than 8 percent.	Moderate: slope is 4 to 8 percent; low bearing capacity. Severe: slope is more than 8 percent.	Severe: poor traffic-supporting capacity; severe inherent erodibility.
Moderate: poor trafficability	Moderate: poor trafficability	Moderate: low bearing capacity. Severe: slope is more than 8 percent.	Servere: poor traffic-supporting capacity; severe inherent erodibility.
Slight: slope is less than 6 percent. Moderate: slope is 6 to 10 percent. Severe: slope is more than 10 percent.	Slight: slope is less than 8 percent. Moderate: slope is more than 8 percent.	Moderate: low bearing capacity. Severe: slope is more than 8 percent.	Severe: poor traffic-supporting capacity; severe inherent erodibility.
Severe: occasional to frequent flooding.	Moderate: somewhat poorly drained; occasional to frequent flooding.	Severe: frequent flooding; somewhat poorly drained.	Severe: occasional to frequent flooding; seasonal high water table.
Severe: slope	Severe: slope	Severe: slope	Severe: slope; 2 to 5 feet to rock; severe inherent erodibility.
Severe: slope	Moderate: slope is 10 to 15 percent. Severe: slope is more than 15 percent.	Severe: slope	Moderate: slope is 10 to 15 percent; severe inherent erodibility. Severe: slope is more than 15 percent.
Slight: slope is 2 to 6 percent. Moderate: slope is 6 to 10 percent. Severe: slope is more than 10 percent.	Slight: slope is 2 to 8 percent. Moderate: slope is 8 to 15 percent. Severe: slope is more than 15 percent.	Moderate: slope is less than 8 percent; low bearing capacity. Severe: slope is more than 8 percent.	Moderate: fair traffic-supporting capacity; slope is less than 8 percent; severe inherent erodibility. Severe: slope is more than 8 percent.
Severe: slope	Severe: slope	Severe: slope	Severe: slope; poor traffic-supporting capacity; severe inherent erodibility.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Slight to moderate: slope; fair trafficability.	Slight: moderately well drained.	Moderate: moderate shrink-swell potential; moderately well drained.	Severe: poor traffic-supporting capacity; severe inherent erodibility.
Slight: slope is less than 6 percent. Moderate: slope is 6 to 10 percent. Severe: slope is more than 10 percent.	Slight: slope is 2 to 8 percent. Moderate: slope is 8 to 15 percent. Severe: slope is more than 15 percent.	Moderate: low bearing capacity; slope is less than 8 percent. Severe: slope is more than 8 percent.	Severe: poor traffic-supporting capacity; severe inherent erodibility.
Moderate: poor trafficability; slope is less than 10 percent. Severe: slope is more than 10 percent.	Moderate: poor trafficability; slope is less than 15 percent. Severe: slope is more than 15 percent.	Moderate: low bearing capacity; slope is less than 8 percent. Severe: slope is more than 15 percent.	Severe: poor traffic-supporting capacity; severe inherent erodibility.

TABLE 10.—*Limitations of the soil*

Soil series and map symbols	Recreational	
	Campsites	Playgrounds
Louisburg: LoE, LoF	Moderate: slope is less than 15 percent. Severe: slope is more than 15 percent.	Severe: slope
Madison: MaB2, MaC2, MaE2	Slight: slope is 2 to 8 percent. Moderate: slope is 8 to 15 percent. Severe: slope is more than 15 percent.	Moderate: slope is 2 to 6 percent. Severe: slope is more than 6 percent.
McE3	Severe: slope	Severe: slope
Musella: MuG	Severe: slope	Severe: slope; 1 to 2 feet to rock
Pacolet: PaB2, PaC2, PaE2, PaF, PaG	Slight: slope is 2 to 8 percent. Moderate: slope is 8 to 15 percent. Severe: slope more than 15 percent.	Moderate: slope is 2 to 6 percent. Severe: slope is more than 6 percent.
PcC3, PcE3	Moderate: poor trafficability; slope is less than 15 percent. Severe: slope is more than 15 percent.	Severe: slope
Porters: PoF, PoG	Severe: slope	Severe: slope
Rabun: RaF, RaG, RbE	Moderate: slope is 10 to 15 percent; coarse fragments make up 15 to 50 percent in some areas. Severe: slope is more than 15 percent.	Severe: slope; coarse fragments make up 15 to 50 percent in some areas.
Saluda: SaE, SaF, SaG	Moderate: slope is 10 to 15 percent. Severe: slope is more than 15 percent.	Severe: slope
Starr: SrB	Slight	Slight: slope is 0 to 2 percent. Moderate: slope is 2 to 6 percent.
Tallapoosa: TaD, TaE, TaF, TaG	Moderate: slope is 6 to 15 percent. Severe: slope is more than 15 percent.	Severe: slope
Toccoa: To	Severe: frequent flooding	Severe: frequent flooding
Tusquitee: TuC	Slight	Moderate: slope is 4 to 6 percent. Severe: slope is more than 6 percent.
Worsham: WoB	Severe: poorly drained	Severe: poorly drained

[1] Engineers and others should not apply specific values to the estimates given for bearing capacity of soils.

for town and country planning—Continued

sites		Sites for low buildings and light industry [1]	Trafficways
Golf fairways	Picnic areas		
Severe: slope; poor productivity.	Moderate: slope is 10 to 15 percent. Severe: slope is more than 15 percent.	Severe: slope	Severe: 2 to 10 feet to rock; slope is more than 10 percent.
Slight: slope is 2 to 6 percent. Moderate: slope is 6 to 10 percent. Severe: slope is more than 10 percent.	Slight: slope is 2 to 8 percent Moderate: slope is 8 to 15 percent. Severe: slope is more than 15 percent.	Moderate: slope is less than 8 percent; low bearing capacity. Severe: slope is more than 8 percent.	Severe: poor traffic-supporting capacity; micaceous.
Severe: slope	Moderate: slope is 10 to 15 percent. Severe: slope is 15 to 25 percent.	Severe: slope	Severe: poor traffic-supporting capacity; micaceous.
Severe: slope; low productivity.	Severe: slope	Severe: slope; 1 to 2 feet to rock.	Severe: slope; 1 to 2 feet to rock.
Slight: slope is 2 to 6 percent. Moderate: slope is 6 to 10 percent. Severe: slope is more than 10 percent.	Slight: slope is 2 to 8 percent. Moderate: slope is 8 to 15 percent. Severe: slope is more than 15 percent.	Moderate: slope is 2 to 8 percent; low bearing capacity. Severe: slope is more than 8 percent.	Severe: poor traffic-supporting capacity.
Moderate: poor trafficability; slope is less than 10 percent. Severe: slope is more than 10 percent.	Moderate: poor trafficability; slope is less than 15 percent. Severe: slope is more than 15 percent.	Moderate: low bearing capacity; slope is less than 8 percent. Severe: slope is more than 8 percent.	Severe: poor traffic-supporting capacity.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: slope; coarse fragments make up 15 to 50 percent in some areas.	Moderate: slope is 10 to 15 percent; coarse fragments make up 15 to 50 percent in some areas. Severe: slope is more than 15 percent.	Severe: slope; 3 to 5 feet to rock.	Severe: slope; stones; 3 to 5 feet to rock.
Severe: slope	Moderate: slope is 10 to 15 percent. Severe: slope is more than 15 percent.	Severe: slope	Severe: slope.
Slight	Slight	Moderate: low bearing capacity.	Moderate: fair traffic-supporting capacity.
Severe: slope	Moderate: slope is 6 to 15 percent. Severe: slope is more than 15 percent.	Severe: slope; 20 to 40 inches to rock.	Severe: slope; 20 to 40 inches to rock.
Severe: frequent flooding	Moderate: frequent flooding	Severe: frequent flooding	Moderate: frequent flooding.
Moderate: slope	Moderate: slope	Moderate: low bearing capacity. Severe: slope is more than 8 percent.	Moderate: fair traffic-supporting capacity.
Severe: poor trafficability; poorly drained.	Severe: poorly drained	Severe: high water table; poorly drained.	Severe: poorly drained.

TABLE 11.—*Soil series classified by higher categories*

Series	Family	Subgroup	Order
Ashe	Coarse-loamy, mixed, mesic	Typic Dystrochrepts	Inceptisols.
Buncombe	Mixed, thermic	Typic Udipsamments	Entisols.
Cataula	Clayey, kaolinitic, thermic	Typic Fragiudults	Ultisols.
Cecil	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Chewacla	Fine-loamy, mixed, thermic	Fluvaquentic Dystrochrepts	Inceptisols.
Clifton	Clayey, mixed, mesic	Humic Hapludults	Ultisols.
Edneyville	Fine-loamy, mixed, mesic	Typic Hapludults	Ultisols.
Grover [1]	Fine-loamy, micaceous, thermic	Typic Hapludults	Ultisols.
Gwinnett	Clayey, kaolinitic, thermic	Typic Rhodudults	Ultisols.
Hayesville	Clayey, oxidic, mesic	Typic Hapludults	Ultisols.
Helena	Clayey, mixed, thermic	Aquic Hapludults	Ultisols.
Hiwassee	Clayey, kaolinitic, thermic	Typic Rhodudults	Ultisols.
Louisburg [2]	Coarse-loamy, mixed, thermic	Ruptic-Ultic Dystrochrepts	Inceptisols.
Madison	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Musella [3]	Fine-loamy, mixed, thermic	Typic Rhodudults	Ultisols.
Pacolet	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Porters	Fine-loamy, mixed, mesic	Humic Hapludults	Ultisols.
Rabun	Clayey, kaolinitic, mesic	Typic Rhodudults	Ultisols.
Saluda	Loamy, mixed, mesic, shallow	Typic Hapludults	Ultisols.
Starr	Fine-loamy, mixed, thermic	Fluventic Dystrochrepts	Inceptisols.
Tallapoosa	Loamy, micaceous, thermic, shallow	Ochreptic Hapludults	Ultisols.
Toccoa	Coarse-loamy, mixed, nonacid, thermic	Typic Udifluvents	Entisols.
Tusquitee	Fine-loamy, mixed, mesic	Humic Hapludults	Ultisols.
Worsham	Clayey, mixed, thermic	Typic Ochraquults	Ultisols.

[1] Some of these soils are taxadjuncts and are outside the defined range of the Grover series. They have a red B2t horizon, or they lack mica flakes in the solum.

[2] These soils are taxadjuncts and are outside the defined range of the Louisburg series. They lack continuous or recurring horizons that show increase of clay.

[3] These soils are taxadjuncts and are outside the defined range of the Musella series. They lack the high content of fragments in the solum, and they have slightly more clay in the Bt horizon.

The level soils, which are on flood plains, commonly have little horizon development. This can be attributed in small part to the effect of relief on the movement of water in and across the soil. Moderately sloping soils commonly have distinct horizons. Steep soils commonly have faint horizons and are shallow to rock. This can be attributed in part to creep or slide down the steep slopes.

Living organisms

The number and kinds of plants and animals that live in and on the soil are determined mainly by the climate, but plant and animal life is influenced by parent material, exposure and slope of the soil, and age of the soil.

Bacteria, fungi, and other micro-organisms have a very important function in soil formation. They hasten the weathering of minerals and the decomposition of organic matter. Larger plants alter the soil microclimate, furnish organic matter, and transfer chemical elements from the subsoil to the surface layer.

Most of the bacteria, fungi, and other micro-organisms in the soils of Pickens County are in the uppermost few inches. The activity of earthworms and other small invertebrates takes place mostly in the A horizon and the upper part of the B horizon, where these organisms slowly but continuously mix the soil material. Bacteria and fungi decompose organic matter and release nutrients for plant use.

Animals play a secondary role in soil formation by grazing on the plants and returning plant nutrients to the soil.

Trees have had a pronounced influence on the formation of soils in Pickens County. They have retarded runoff, fractured rocks, brought up plant nutrients from deep in the soils, provided protective cover to control erosion, caused the soils to be more friable, and provided cover and food for animal life.

Time

The length of time that parent material has been exposed to soil-forming processes accounts for many differences in soils. In this county, the net effect of the soil-forming processes is the formation of distinct horizons that show clay loss or clay accumulation. Such horizons have not formed in alluvial areas where the present soil material has been in place only a few score or a few hundred years. Buncombe, Chewacla, Starr, and Toccoa soils are examples of soils formed in alluvium. Neither have distinct horizons formed in areas where the soils are very steep and the uppermost 2 feet of soil has been in place only a short time. Ashe soils are examples of soils that developed under these conditions. In about 90 percent of the county, however, the soil material has been in place long enough for distinct horizons to develop.

Classification of the Soils

Two systems of classifying soils above the series level have been used in the United States in recent years. The older system was adopted in 1938 (*2*) and was later revised (*9*). The system currently used was adopted for general use by the National Cooperative Soil Survey in 1965 and was supplemented in March 1967 and September 1968 (*13*). Table 11 shows the classification of the soil series according to the current system.

The current system consists of six categories. Beginning with the most inclusive, these categories are the order, the suborder, the great group, the subgroup, the family, and the series. This system is under continual study (*8*), and readers interested in its development should refer to the latest literature available. These six categories are discussed in the following paragraphs.

ORDER.—Ten soil orders recognized in the current classification system are: Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate the soil orders are those that tend to give broad climatic groupings of the soils. The two exceptions to this are the Entisols and Histosols, which occur in many different climates. Because of the importance of climate to soil formation, the orders to some extent are climatic zonal groups and they tend to have definite geographic ranges.

Three of the ten soil orders are represented in Pickens County. These are the Entisols, Inceptisols, and Ultisols.

Entisols are recent soils in which there has been no horizon development. This order is represented in Pickens County by soils of the Buncombe and Toccoa series.

Inceptisols occur mostly on young, but not recent, land surfaces. This order is represented in this county by soils of the Ashe, Chewacla, Louisburg, and Starr series.

Ultisols are mineral soils that have a clay-enriched B horizon that has less than 35 percent base saturation. The base saturation decreases with increased depth. This order is represented in this county by soils of the Cataula, Cecil, Clifton, Edneyville, Grover, Gwinnett, Hayesville, Helena, Hiwassee, Madison, Musella, Pacolet, Porters, Rabun, Saluda, Tallapoosa, Tusquitee, and Worsham series.

SUBORDER.—Each of the soil orders is divided into suborders. Soils within a suborder are similar in soil properties that mainly reflect the presence or absence of waterlogging, or soil differences that result from climate or vegetation. The following suborders are represented in this county: Aquults, Fluvents, Ochrepts, Psamments, and Udults. Soils classified as Udults make up about 90 percent of the county.

GREAT GROUP.—Suborders are divided into great groups on the basis of uniformity in the presence, absence, and arrangement of diagnostic horizons and other characteristics. The diagnostic horizons are those that contain illuvial clay, iron, and humus; or they are a thick, dark-colored surface horizon; or they constitute a pan that interferes with movement of water and root development. Some other features used to distinguish great groups are colors of dark brown and dark red, major differences in chemical composition, differences in soil temperature, wide differences in base saturation, and differences in content of soil moisture. The name of the great group is the last word in the name of the subgroup. The following great groups are represented in this county: Dystrochrepts, Fragiudults, Hapludults, Ochraquults, Rhodudults, Udifluvents, and Udipsamments.

SUBGROUP.—Subgroups are subdivisions of a great group and are defined in terms of reference to the great groups. One of the subgroups represents the central (typic) concept of the group. Others have properties of another great group, suborder, or order that are strongly enough expressed to be significant. Subgroups may also be established because of some soil property that is unlike that of any great group, suborder, or order, but which requires recognition. The names of subgroups are derived by placing one or more adjectives before the name of the great group.

FAMILY.—Families are established within a subgroup mainly on the basis of properties that affect the growth of plants or the behavior of soils when used for engineering. The properties most commonly considered are texture, mineralogy, and soil temperature. For some categories, reaction, permeability, depth of soil, consistence, moisture equivalent, and slope or contour of soil may also be significant.

SERIES.—The series consists of a group of soils that formed in a particular kind of parent material and have genetic horizons that, except for texture of the surface layer, are similar in differentiating characteristics and in arrangement in the profile. Among these characteristics are color, texture, thickness, structure, reaction, consistence, and mineralogical and chemical composition.

Additional Facts About the County

This section gives general facts about Pickens County. It briefly discusses the climate and physical features of the county and other subjects of general interest.

Climate [5]

The climate of Pickens County is mild and temperate, and rainfall is well distributed throughout the year. Day-to-day weather is controlled largely by the movement of pressure systems across the country, but complete exchanges of air masses are relatively few in summer when masses of tropical maritime air persist for long periods.

Records of wind, humidity, and sunshine are not available for Pickens County. The nearest records are those kept at Greenville. Averages from this station indicate that the prevailing winds are northeasterly in autumn and winter and southwesterly in spring and summer. Average windspeed is about 8 miles per hour. In the Greenville area, the strongest wind recorded for 1 minute was 70 miles per hour. Average daily (1:00 p.m.) readings of relative humidity are 53 percent in winter, 49 percent in spring, 51 percent in summer, and 52 percent in autumn. Corresponding values at 7:00 a.m. are 75 percent, 76 percent, 82 percent, and 81 percent, respectively.

Rainfall one-tenth of an inch or more occurs about 78 days in an average year. The heaviest annual rainfall recorded in this general area in recent years was about 63 inches near Pickens in 1957. The least was about 37 inches in 1955. The normal annual precipitation is about 55 inches.

The sun is visible about 64 percent of the daylight hours in an average year. From February to August, it is visible 55 to 68 percent of these hours. Skies are cloudy to overcast about 42 percent of an average year. Clouds are below 500 feet about 2 percent of the year and below 1,000 feet about 6 percent of the year.

Summers are warm and long. Temperatures of 90° F. or higher occur on an average of 48 days a year. Temperatures of 100° are infrequent because the elevation, which

[5] By HOLBROOK LANDERS, State climatologist, National Weather Service, Columbia.

is about 700 to 3,554 feet, has a moderating effect. One-fourth of the annual rainfall occurs in summer. Table 12 shows data for temperature and precipitation at Pickens.

Autumn is warm and pleasant. It is the driest season of the year. The average date of the first autumn frost is November 7, and in 1 year out of 10, a frost occurs earlier than October 23. Table 13 shows the probabilities of the first freeze in fall and last in spring for specified dates. The data are from Greenville and Walhalla.

Winters are mild. Minimum temperatures of 32° or less occur on 2 days out of 3. Snowfalls occur each winter, but significant amounts come only once every 2 or 3 years. Winter temperatures fall to 20° or lower on 10 days and to 15° or lower on 3 days. Winter is the rainiest season, when numerous fronts and cyclones pass through the county. The mountains that are oriented northeast-southwest provide some protection against cold winter air masses arriving from the northwest.

TABLE 12.—*Temperature and precipitation*

[All data from Pickens]

Month	Temperature				Precipitation				
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with—		Average total	One year in 10 will have—		Days with snow cover of 1 inch or more	Average depth of snow on days with snow cover
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than—	More than—		
	°F.	°F.	°F.	°F.	*Inches*	*Inches*	*Inches*	*Number*	*Inches*
January	54.5	33.9	70	18	4.9	2.2	8.0	1	0.7
February	57.7	34.5	72	22	5.3	2.8	9.6	1	1.0
March	63.6	39.2	77	26	6.3	3.5	9.0	1	1.1
April	74.1	47.7	85	35	4.6	2.0	7.2	0	0
May	81.2	56.3	90	48	3.8	2.1	5.5	0	0
June	87.6	63.7	94	57	4.4	2.2	7.0	0	0
July	88.9	67.0	96	63	4.8	1.6	8.4	0	0
August	88.3	62.4	96	62	4.2	1.2	7.8	0	0
September	82.6	60.6	92	51	4.0	0.9	6.9	0	0
October	73.4	50.0	84	37	3.1	0.7	8.6	0	0
November	63.4	39.7	75	26	3.9	1.3	7.9	(1)	(2)
December	54.4	32.9	68	19	5.2	2.1	9.1	(1)	.5
Year	72.5	49.0	[3] 98	[4] 10	54.7	45.0	61.7	3	3.3

[1] Less than half a day.
[2] Trace (less than 0.05 inch).
[3] Average highest annual maximum.
[4] Average lowest annual minimum.

TABLE 13.—*Probabilities of last freezing temperatures in spring and first in fall*

[All data from Greenville and Walhalla]

Probability	Dates for given probability and temperature—		
	24° F. or lower	28° F. or lower	32° F. or lower
Spring:			
1 year in 10 later than	Mar. 25	Apr. 6	Apr. 23
2 years in 10 later than	Mar. 17	Mar. 29	Apr. 16
5 years in 10 later than	Mar. 4	Mar. 16	Apr. 2
Fall:			
1 year in 10 earlier than	Nov. 13	Nov. 2	Oct. 23
2 years in 10 earlier than	Nov. 18	Nov. 7	Oct. 28
5 years in 10 earlier than	Nov. 30	Nov. 17	Nov. 7

Spring is a period of transition between the end of a rather uniform winter and the beginning of a rather uniform summer. March is a month of heavy rain. As the rain decreases, a secondary dry period occurs late in April and early in May. Steady rains typical of winter are likely early in spring. Scattered thunderstorm activity begins late in spring when winter gives way to summer.

Severe weather can occur in the form of tornadoes, tropical storms, and hurricanes. There have been only four tornadoes in Pickens County in recent years. No full-fledged hurricane has passed through the county in 50 years, but less violent tropical storms affect the area about once in 5 to 10 years. Such storms bring heavy rain and cause minor wind damage.

Geology, Physiography, and Drainage

Pickens County is underlain by seven geologic formations (*3*). In six of these formations, some form of gneiss is the dominant rock type, and in the seventh mica schist is the dominant rock. There is a rough general correlation between the underlying geologic formations and the soil associations or dominant soil series. Augen gneiss underlies most of the Edneyville-Porters-Hayesville and the Ashe-Saluda-Stony land associations. Hornblende gneiss, gran-

ite gneiss, injection gneiss, biotite gneiss, Beverly granite gneiss, and mica schist underlie the Pacolet-Grover-Hiwassee association. Beverly granite gneiss, biotite gneiss, mica schist, and a few small areas of hornblende gneiss underlie the Cecil-Hiwassee-Madison and the Cecil-Madison-Pacolet associations. The Toccoa-Chewacla association is underlain by all these formations, but depths to recognizable geologic formations are commonly more than 10 feet.

Pickens County is mainly on the Piedmont Plateau, but its northwestern part is in the Blue Ridge Mountains. The Piedmont Plateau consists of dominantly sloping to moderately steep uplands that are dissected by many branching drains. Flood plains are relatively narrow, and ridgetops or stream divides are narrow to medium in width. The Blue Ridge Mountain section consists of steep to very steep uplands that are dissected by many branching drainageways. Flood plains and stream divides are very narrow.

The Keowee and Toxaway Rivers form the western boundary of Pickens County and, with their tributaries, drain about two-thirds of the county. The Saluda and South Saluda Rivers form the eastern boundary and part of the northern boundary of the county and, with their tributaries, drain about one-third of the county. The branching tributaries form a pattern that reaches to within a few hundred feet of any point in the county. Hence, surface runoff quickly reaches stream channels and is moved away, which contributes to good soil drainage. Stream channels generally are shallow, and flood plains are frequently flooded.

Literature Cited

(1) AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS.
1961. STANDARD SPECIFICATIONS FOR HIGHWAY MATERIALS AND METHODS OF SAMPLING AND TESTING. Ed. 8, 2 v., illus.

(2) BALDWIN, M., KELLOGG, C. E., and THORP, J.
1938. SOIL CLASSIFICATION. U.S. Dept. Agr. Yearbook, pp. 979–1001.

(3) CAZEAU, C. J., and BROWN, C. Q.
1963. GUIDE TO THE GEOLOGY OF PICKENS AND OCONEE COUNTIES, SOUTH CAROLINA. GEOLOGIC NOTES, DIVISION OF GEOLOGY, STATE DEVELOPMENT BOARD. Columbia, S.C., 7 v., No. 5, pp. 32–40, with map.

(4) GANSNER, DAVID A., and SHAUDYS, EDGAR T.
1969. OPPORTUNITIES FOR PULPWOOD GROWING INVESTMENT IN SOUTHEASTERN OHIO. U.S. Dept. Agr. Forest Service Research Paper NE–151, 22 pp., illus.

(5) GOEBEL, N. B., and SHIPMAN, R. D.
1964. VOLUME YIELDS OF LOBLOLLY PINE PLANTATIONS FOR A VARIETY OF SITES IN THE SOUTH CAROLINA PIEDMONT. S.C. Agr. Expt. Station, Forest Research Series No. 13. (Revised 1966; revised 1969, Goebel, N. B., and Warner, J. R.)

(6) KNIGHT, HERBERT A., and MCCLURE, JOE P.
1969. SOUTH CAROLINA'S TIMBER, 1968. U.S. Dept. Agr. Forest Resource Bulletin SE–13, 44 pp., illus.

(7) PORTLAND CEMENT ASSOCIATION.
1962. PCA SOIL PRIMER. 52 pp., illus. Chicago.

(8) SIMONSON, ROY W.
1962. SOIL CLASSIFICATION IN THE UNITED STATES. Science, v. 137, No. 3535: 1027–1034, illus.

(9) THORP, JAMES, and SMITH, GUY D.
1949. HIGHER CATEGORIES OF SOIL CLASSIFICATION: ORDER, SUBORDER, AND GREAT SOIL GROUPS. Soil Sci. 67: 117–126.

(10) TILLER, JOHN R.
1969. REPORT OF THE STATE COMMISSION OF FORESTRY FOR THE YEAR JULY 1, 1968 TO JUNE 30, 1969. Columbia, S.C., 92 pp., illus.

(11) UHLAND, R. E., and O'NEAL, ALFRED M.
1951. SOIL PERMEABILITY DETERMINATIONS FOR USE IN SOIL AND WATER CONSERVATION. U.S. Dept. Agr. Soil Conservation Service, Tech. Paper 101, 36 pp., illus.

(12) UNITED STATES DEPARTMENT OF AGRICULTURE.
1951. SOIL SURVEY MANUAL. U.S. Dept. Agr. Handbook 18, 503 pp., illus.

(13) ———
1960. SOIL CLASSIFICATION, A COMPREHENSIVE SYSTEM, 7TH APPROXIMATION. 265 pp., illus. [Supplements issued in March 1967 and September 1968]

(14) UNITED STATES DEPARTMENT OF DEFENSE.
1968. UNIFIED SOIL CLASSIFICATION SYSTEM FOR ROADS, AIRFIELDS, EMBANKMENTS AND FOUNDATIONS. MIL–STD–619, 30 pp., illus.

Glossary

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity (also termed available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Erosion. The wearing away of the land surface by wind (sandblast), running water, and other geological agents.

Gleyed soil. A soil in which waterlogging and lack of oxygen have caused the material in one or more horizons to be neutral gray in color. The term "gleyed" is applied to soil horizons with yellow and gray mottling caused by intermittent waterlogging.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material may be sandy or clayey, and it may be cemented by iron oxide, silica, calcium carbonate, or other substance.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by

prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Leaching. The removal of soluble materials from soils or other material by percolating water.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few*, *common*, and *many;* size—*fine*, *medium*, and *coarse;* and contrast—*faint*, *distinct*, and *prominent*. The size measurements are these: *fine*, less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium*, ranging from 5 to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse*, more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Natural soil drainage. Refers to the conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and the C horizons.

Somewhat poorly drained soils are wet for significant periods but not all the time, and in Podzolic soils commonly have mottlings below a depth of 6 to 16 inches, in the lower A horizon and in the B and C horizons.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Nutrient, plant. Any element taken in by a plant, essential to its growth, and used by it in the production of food and tissue. Nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps other elements obtained from the soil and carbon, hydrogen, and oxygen obtained largely from the air and water, are plant nutrients.

Parent material. Disintegrated and partly weathered rock from which soil has formed.

Percolation. The downward movement of water through the soil.

Permeability. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are as follows: *very slow*, *slow*, *moderately slow*, *moderate*, *moderately rapid*, *rapid*, and *very rapid*.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Sand. Individual rock or mineral fragments in soils having diameters ranging from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Saprolite. Thoroughly decomposed, but untransported rock.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and granular. *Structureless* soils are (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

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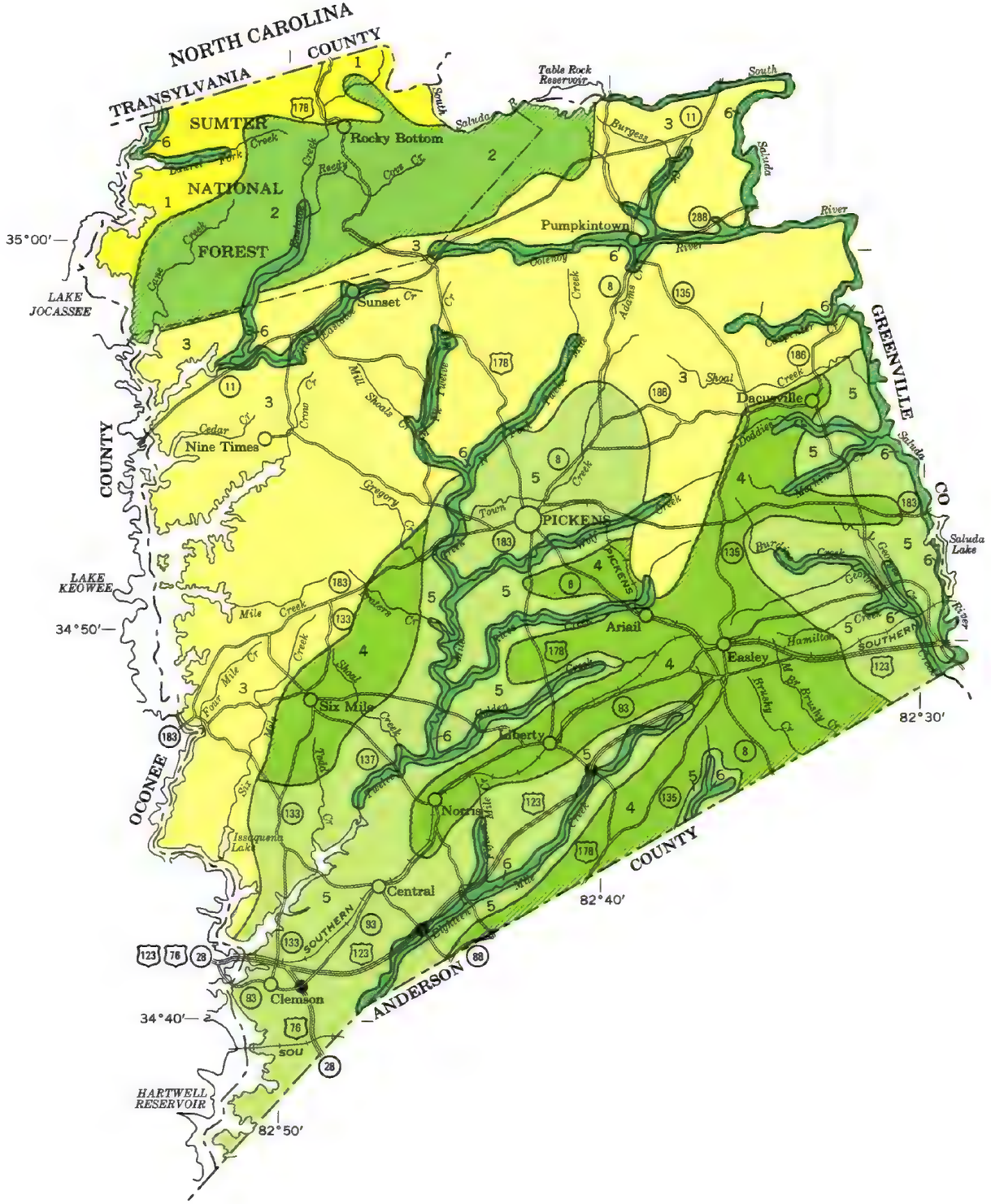

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U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SOUTH CAROLINA AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

PICKENS COUNTY, SOUTH CAROLINA

Scale 1:253,440
1 0 1 2 3 4 Miles

SOIL ASSOCIATIONS

1 — Edneyville-Porters-Hayesville association: Well-drained, strongly sloping to very steep soils that have a loamy subsoil and are moderately deep or deep to weathered rock; on mountains

2 — Ashe-Saluda-Stony land association: Excessively drained to well-drained, strongly sloping to very steep soils that have a loamy subsoil and are moderately deep or shallow to weathered rock; on mountains

3 — Pacolet-Grover-Hiwassee association: Well-drained, moderately steep or steep soils that have a dominantly clayey subsoil and are moderately deep or deep to weathered rock; on uplands

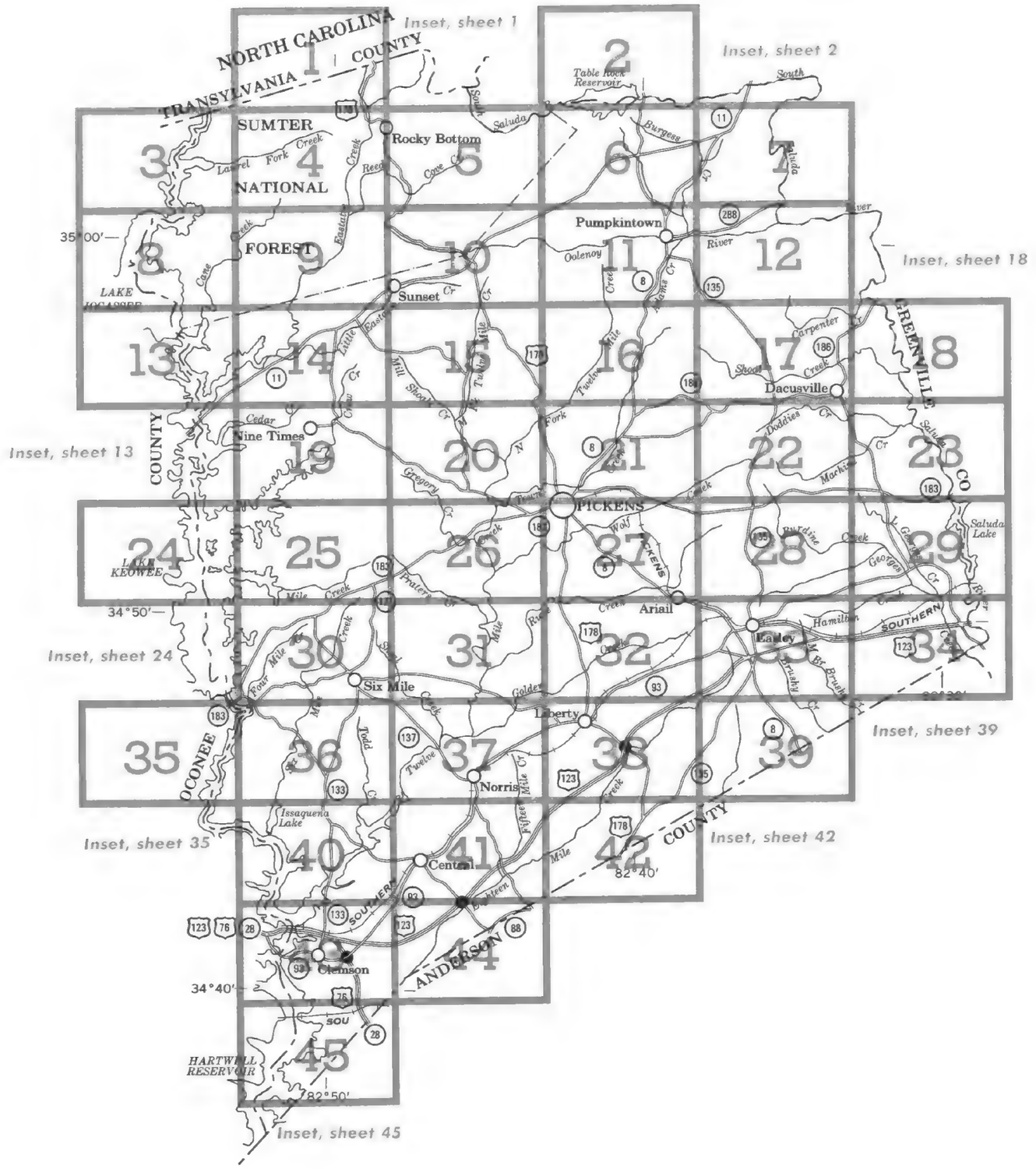
4 — Cecil-Hiwassee-Madison association: Well-drained, dominantly sloping soils that have a dominantly clayey subsoil and are moderately deep or deep to weathered rock; on uplands

5 — Cecil-Madison-Pacolet association: Well-drained, strongly sloping to steep soils that have a dominantly clayey subsoil and are moderately deep or deep to weathered rock; on uplands

6 — Toccoa-Chewacla association: Well-drained to somewhat poorly drained, nearly level soils that are dominantly loamy throughout and are subject to flooding; on bottom lands

This map is for general planning. It shows only the major soils and does not contain sufficient detail for operational planning.

Published 1971



INDEX TO MAP SHEETS

PICKENS COUNTY, SOUTH CAROLINA

Scale 1:253,440

1 0 1 2 3 4 Miles

Original text from each map sheet:
"This map is one of a set compiled in 1970 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the South Carolina Agricultural Experiment Station."

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Dual
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State or county

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail
- Railroad
- Ferry (FY)
- Ford (FORD)
- Grade
- R. R. over
- R. R. under

Tunnel

Buildings
- School
- Church

Mine and quarry

Borrow pit

Power line

Pipeline

Cemetery

Dams

Levee

Tanks

Well, oil or gas

Forest fire or lookout station

Windmill

BOUNDARIES

- National or state
- County
- Reservation
- Land grant
- Small park, cemetery, airport
- Land survey division corners

DRAINAGE

Streams, double-line
- Perennial
- Intermittent

Streams, single-line
- Perennial
- Intermittent
  - Crossable with tillage implements
  - Not crossable with tillage implements
  - Unclassified

Canals and ditches (CANAL)

Lakes and ponds
- Perennial (water, w)
- Intermittent (int)

Spring

Marsh or swamp

Wet spot

Alluvial fan

Drainage end

RELIEF

Escarpments
- Bedrock
- Other

Prominent peak

Depressions

	Large	Small
Crossable with tillage implements		
Not crossable with tillage implements		
Contains water most of the time		

SOIL SURVEY DATA

- Soil boundary and symbol (Dx)
- Gravel
- Stoniness
  - Stony
  - Very stony
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gully

PROPOSED LAKE JOCASSEE AND PROPOSED LAKE KEOWEE

Lake Jocassee and Lake Keowee are two proposed major flood control reservoirs located partially within the county and along its western boundary. The proposed areas of the reservoirs (lakes) are overprinted with black fine-diagonal lines. Their flood control maximum pool shorelines are shown as black dashed lines. Lake Jocassee maximum pool shoreline is delineated at elevation 1,110 feet; and, Lake Keowee maximum pool shoreline is delineated at elevation 800 feet. The normal pool shorelines are not delineated or shown.

SOIL LEGEND

The first capital letter is the initial one of the soil name. A second capital letter, B, C, D, E, F, or G, shows the slope. Most symbols without a slope letter are those of nearly level soils, but Rock land and Stony land have a considerable range of slope. A final number, 2 or 3, in the symbol shows that the soil is eroded or severely eroded.

SYMBOL	NAME
AsE	Ashe sandy loam, 10 to 25 percent slopes
AsF	Ashe sandy loam, 25 to 40 percent slopes
AsG	Ashe sandy loam, 40 to 90 percent slopes
Bu	Buncombe loamy sand
CaD3	Cataula clay loam, 6 to 15 percent slopes, severely eroded
CdB2	Cataula sandy loam, 2 to 6 percent slopes, eroded
CdC2	Cataula sandy loam, 6 to 10 percent slopes, eroded
CeB3	Cecil clay loam, 2 to 6 percent slopes, severely eroded
CeC3	Cecil clay loam, 6 to 10 percent slopes, severely eroded
ClB2	Cecil sandy loam, 2 to 6 percent slopes, eroded
ClC2	Cecil sandy loam, 6 to 10 percent slopes, eroded
ClD2	Cecil sandy loam, 10 to 15 percent slopes, eroded
Cm	Chewacla loam
Co	Chewacla soils, frequently flooded
CtF	Clifton fine sandy loam, 15 to 35 percent slopes
EdE	Edneyville fine sandy loam, 10 to 25 percent slopes
EdF	Edneyville fine sandy loam, 25 to 40 percent slopes
EdG	Edneyville fine sandy loam, 40 to 80 percent slopes
GrB2	Grover fine sandy loam, 2 to 6 percent slopes, eroded
GrD2	Grover fine sandy loam, 6 to 15 percent slopes, eroded
GrE	Grover fine sandy loam, 15 to 25 percent slopes
GrF	Grover fine sandy loam, 25 to 40 percent slopes
GrG	Grover fine sandy loam, 40 to 80 percent slopes
GwF	Gwinnett sandy loam, 25 to 40 percent slopes
GwG	Gwinnett sandy loam, 40 to 60 percent slopes
HeF	Hayesville fine sandy loam, 15 to 40 percent slopes
HeG	Hayesville fine sandy loam, 40 to 80 percent slopes
HlB	Helena sandy loam, 2 to 6 percent slopes
HwB2	Hiwassee sandy loam, 2 to 6 percent slopes, eroded
HwC2	Hiwassee sandy loam, 6 to 10 percent slopes, eroded
HwE2	Hiwassee sandy loam, 10 to 25 percent slopes, eroded
HyB2	Hiwassee clay loam, 2 to 6 percent slopes, eroded
HyC3	Hiwassee clay loam, 6 to 10 percent slopes, severely eroded
HyE3	Hiwassee clay loam, 10 to 25 percent slopes, severely eroded
LoE	Louisburg sandy loam, 10 to 25 percent slopes
LoF	Louisburg sandy loam, 25 to 40 percent slopes
MaB2	Madison sandy loam, 2 to 6 percent slopes, eroded
MaC2	Madison sandy loam, 6 to 10 percent slopes, eroded
MaE2	Madison sandy loam, 10 to 25 percent slopes, eroded
McE3	Madison clay loam, 10 to 25 percent slopes, severely eroded
MuG	Musella soils, 40 to 80 percent slopes
PoB2	Pacolet fine sandy loam, 2 to 6 percent slopes, eroded
PaC2	Pacolet fine sandy loam, 6 to 10 percent slopes, eroded
PaE2	Pacolet fine sandy loam, 10 to 25 percent slopes, eroded
PaF	Pacolet fine sandy loam, 25 to 40 percent slopes
PaG	Pacolet fine sandy loam, 40 to 80 percent slopes
PcC3	Pacolet clay loam, 2 to 10 percent slopes, severely eroded
PcE3	Pacolet clay loam, 10 to 25 percent slopes, severely eroded
PoF	Porters loam, 15 to 40 percent slopes
PoG	Porters loam, 40 to 70 percent slopes
RaF	Rabun cobbly loam, 25 to 40 percent slopes
RaG	Rabun cobbly loam, 40 to 70 percent slopes
RbE	Rabun loam, 10 to 25 percent slopes
Ro	Rock land
SaE	Saluda sandy loam, 10 to 25 percent slopes
SaF	Saluda sandy loam, 25 to 40 percent slopes
SaG	Saluda sandy loam, 40 to 70 percent slopes
SrB	Starr loam, 0 to 6 percent slopes
St	Stony land
TaD	Tallapoosa loam, 6 to 15 percent slopes
TaE	Tallapoosa loam, 15 to 25 percent slopes
TaF	Tallapoosa loam, 25 to 40 percent slopes
TaG	Tallapoosa loam, 40 to 80 percent slopes
To	Toccoa soils
TuC	Tusquitee loam, 4 to 10 percent slopes
WoB	Worsham sandy loam, 2 to 6 percent slopes

Soil map constructed 1970 by Cartographic Division, Soil Conservation Service, USDA, from 1965 aerial photographs. Controlled mosaic based on South Carolina plane coordinate system, north zone, Lambert conformal conic projection, 1927 North American datum.

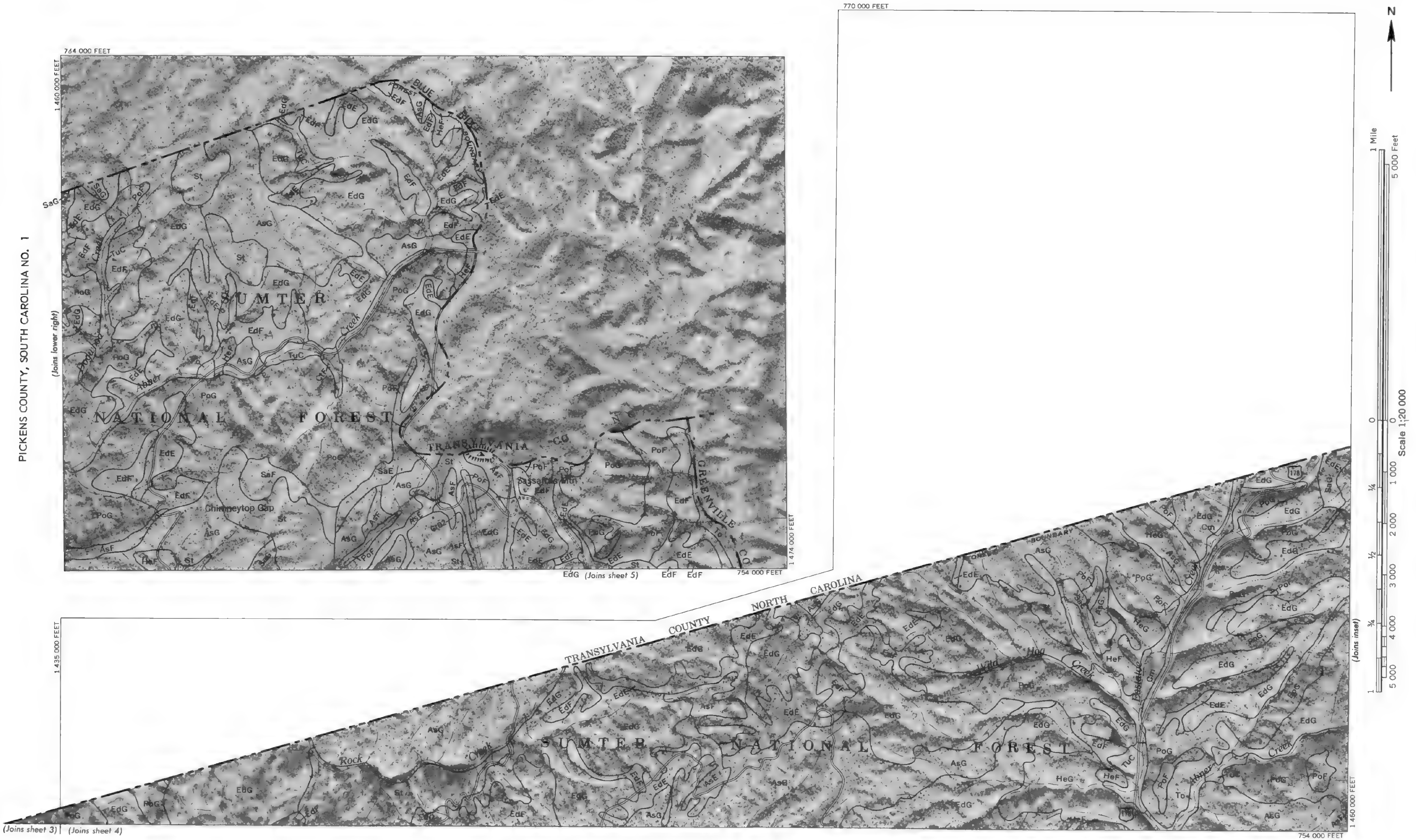
GUIDE TO MAPPING UNITS

For complete information about a mapping unit, read both the description of the mapping unit and that of the soil series to which it belongs. A technical description of a representative profile is given in the description of each soil series. In referring to a capability unit or a woodland group, read the introduction to the section it is in for general information about its management. Dashes in columns mean that the mapping unit was not placed in a woodland suitability group. Other information is given in tables as follows:

Acreage and extent, table 1, page 5.
Estimated yields and suitability for crops, tables 2 and 3, pages 32 through 35.
Woodland, tables 4 and 5, pages 36 and 40.
Wildlife, table 6, page 42.
Engineering uses of the soils, tables 7, 8, and 9, pages 46 through 59.
Town and country planning, table 10, page 62.

Map symbol	Mapping unit	Described on page	Capability unit		Woodland suitability group	
			Symbol	Page	Symbol	Page
AsE	Ashe sandy loam, 10 to 25 percent slopes	5	VIe-2	31	3r2	38
AsF	Ashe sandy loam, 25 to 40 percent slopes	5	VIIe-2	31	3r2	38
AsG	Ashe sandy loam, 40 to 90 percent slopes	6	VIIe-2	31	3r3	38
Bu	Buncombe loamy sand	6	IIIs-2	29	2s8	38
CaD3	Cataula clay loam, 6 to 15 percent slopes, severely eroded	7	VIe-3	31	5c3e	40
CdB2	Cataula sandy loam, 2 to 6 percent slopes, eroded	7	IIIe-3	29	3o7	38
CdC2	Cataula sandy loam, 6 to 10 percent slopes, eroded	7	IVe-2	30	3o7	38
CeB3	Cecil clay loam, 2 to 6 percent slopes, severely eroded	9	IIIe-1	29	4c2e	39
CeC3	Cecil clay loam, 6 to 10 percent slopes, severely eroded	9	IVe-1	29	4c2e	39
ClB2	Cecil sandy loam, 2 to 6 percent slopes, eroded	8	IIe-1	28	3o7	38
ClC2	Cecil sandy loam, 6 to 10 percent slopes, eroded	8	IIIe-1	29	3o7	38
ClD2	Cecil sandy loam, 10 to 15 percent slopes, eroded	8	IVe-1	29	3o7	38
Cm	Chewacla loam	9	IIIw-2	29	1w8	37
Co	Chewacla soils, frequently flooded	9	Vw-2	30	1w8	37
CtF	Clifton fine sandy loam, 15 to 35 percent slopes	10	VIe-1	31	2r8	38
EdE	Edneyville fine sandy loam, 10 to 25 percent slopes	11	VIe-1	31	2r8	38
EdF	Edneyville fine sandy loam, 25 to 40 percent slopes	11	VIIe-2	31	2r8	38
EdG	Edneyville fine sandy loam, 40 to 80 percent slopes	11	VIIe-2	31	2r9	38
GrB2	Grover fine sandy loam, 2 to 6 percent slopes, eroded	12	IIe-2	28	3o7	38
GrD2	Grover fine sandy loam, 6 to 15 percent slopes, eroded	12	IVe-1	29	3o7	38
GrE	Grover fine sandy loam, 15 to 25 percent slopes	12	VIe-1	31	3r8	39
GrF	Grover fine sandy loam, 25 to 40 percent slopes	13	VIIe-2	31	3r8	39
GrG	Grover fine sandy loam, 40 to 80 percent slopes	13	VIIe-2	31	3r9	39
GwF	Gwinnett sandy loam, 25 to 40 percent slopes	13	VIIe-1	31	3r8	39
GwG	Gwinnett sandy loam, 40 to 60 percent slopes	14	VIIe-1	31	3r9	39
HeF	Hayesville fine sandy loam, 15 to 40 percent slopes	14	VIIe-2	31	2r8	38
HeG	Hayesville fine sandy loam, 40 to 80 percent slopes	14	VIIe-2	31	2r9	38
HlB	Helena sandy loam, 2 to 6 percent slopes	15	IIe-3	28	3w8	38
HwB2	Hiwassee sandy loam, 2 to 6 percent slopes, eroded	15	IIe-1	28	3o7	38
HwC2	Hiwassee sandy loam, 6 to 10 percent slopes, eroded	16	IIIe-1	29	3o7	38
HwE2	Hiwassee sandy loam, 10 to 25 percent slopes, eroded	16	VIe-1	31	3r8	39
HyB2	Hiwassee clay loam, 2 to 6 percent slopes, eroded	16	IIIe-1	29	4c2e	39
HyC3	Hiwassee clay loam, 6 to 10 percent slopes, severely eroded	16	IVe-1	29	4c2e	39
HyE3	Hiwassee clay loam, 10 to 25 percent slopes, severely eroded	16	VIe-1	31	4c3e	39
LoE	Louisburg sandy loam, 10 to 25 percent slopes	17	VIIe-2	31	3r8	39
LoF	Louisburg sandy loam, 25 to 40 percent slopes	17	VIIe-2	31	3r8	39
MaB2	Madison sandy loam, 2 to 6 percent slopes, eroded	18	IIe-1	28	3o7	38
MaC2	Madison sandy loam, 6 to 10 percent slopes, eroded	18	IIIe-1	29	3o7	38
MaE2	Madison sandy loam, 10 to 25 percent slopes, eroded	18	VIe-1	31	3r8	39
McE3	Madison clay loam, 10 to 25 percent slopes, severely eroded	18	VIIe-1	31	4c3e	39
MuG	Musella soils, 40 to 80 percent slopes	19	VIIe-1	31	3r9	39
PaB2	Pacolet fine sandy loam, 2 to 6 percent slopes, eroded	19	IIe-1	28	3o7	38
PaC2	Pacolet fine sandy loam, 6 to 10 percent slopes, eroded	19	IIIe-1	29	3o7	38
PaE2	Pacolet fine sandy loam, 10 to 25 percent slopes, eroded	20	VIe-1	31	3r8	39
PaF	Pacolet fine sandy loam, 25 to 40 percent slopes	20	VIIe-1	31	3r8	39
PaG	Pacolet fine sandy loam, 40 to 80 percent slopes	20	VIIe-1	31	3r9	39
PcC3	Pacolet clay loam, 2 to 10 percent slopes, severely eroded	20	IVe-1	20	4c2e	39
PcE3	Pacolet clay loam, 10 to 25 percent slopes, severely eroded	20	VIIe-1	31	4c3e	39
PoF	Porters loam, 15 to 40 percent slopes	21	VIIe-2	31	2r8	38
PoG	Porters loam, 40 to 70 percent slopes	21	VIIe-2	31	2r9	38
RaF	Rabun cobbly loam, 25 to 40 percent slopes	22	VIIe-2	31	2x8	37
RaG	Rabun cobbly loam, 40 to 70 percent slopes	22	VIIe-2	31	2r9	38
RbE	Rabun loam, 10 to 25 percent slopes	21	VIe-1	31	2r8	38
Ro	Rock land	22	VIIIs-1	31	---	--
SaE	Saluda sandy loam, 10 to 25 percent slopes	22	VIe-2	31	4d2	39
SaF	Saluda sandy loam, 25 to 40 percent slopes	22	VIIe-2	31	4d2	39
SaG	Saluda sandy loam, 40 to 70 percent slopes	23	VIIe-2	31	4d3	39
SrB	Starr loam, 0 to 6 percent slopes	23	IIe-1	28	1o7	37
St	Stony land	23	VIIs-2	31	---	--
TaD	Tallapoosa loam, 6 to 15 percent slopes	25	VIe-2	31	4o1	39
TaE	Tallapoosa loam, 15 to 25 percent slopes	25	VIIe-2	31	4r2	39
TaF	Tallapoosa loam, 25 to 40 percent slopes	25	VIIe-2	31	4r2	39
TaG	Tallapoosa loam, 40 to 80 percent slopes	25	VIIe-2	31	4r3	40
To	Toccoa soils	25	IIw-2	29	1o7	37
TuC	Tusquitee loam, 4 to 10 percent slopes	25	IIIe-1	29	2o7	37
WoB	Worsham sandy loam, 2 to 6 percent slopes	27	Vw-1	30	2w8	38

420-442 O - 72 (Face maps)



Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

(2)

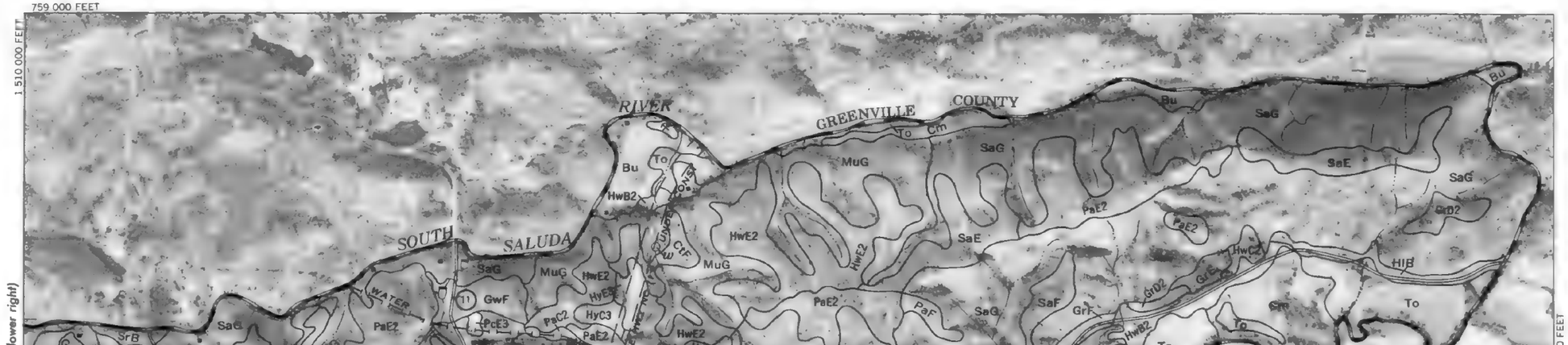
N

770 000 FEET

1 485 000 FEET

759 000 FEET

1 510 000 FEET



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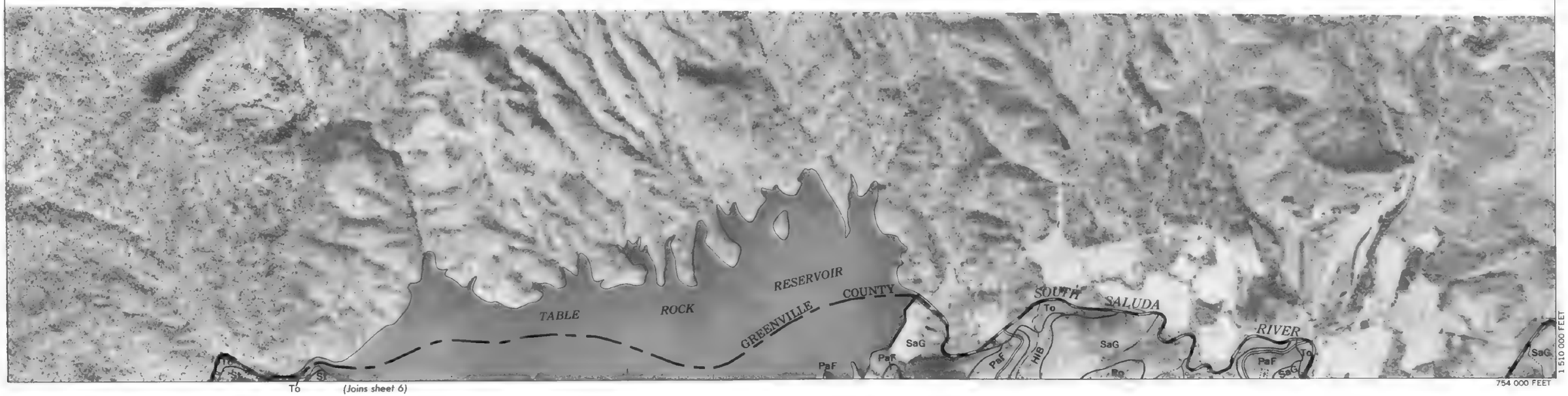
(Joins sheet 7)

1 530 000 FEET

754 000 FEET



To (Joins sheet 6)

1 510 000 FEET

754 000 FEET

(Joins inset)

1 Mile

5 000 Feet

0 0

Scale 1:20 000

1/4 1 000

1/2 2 000

3/4 3 000

1 4 000

5 000

PICKENS COUNTY, SOUTH CAROLINA NO. 2

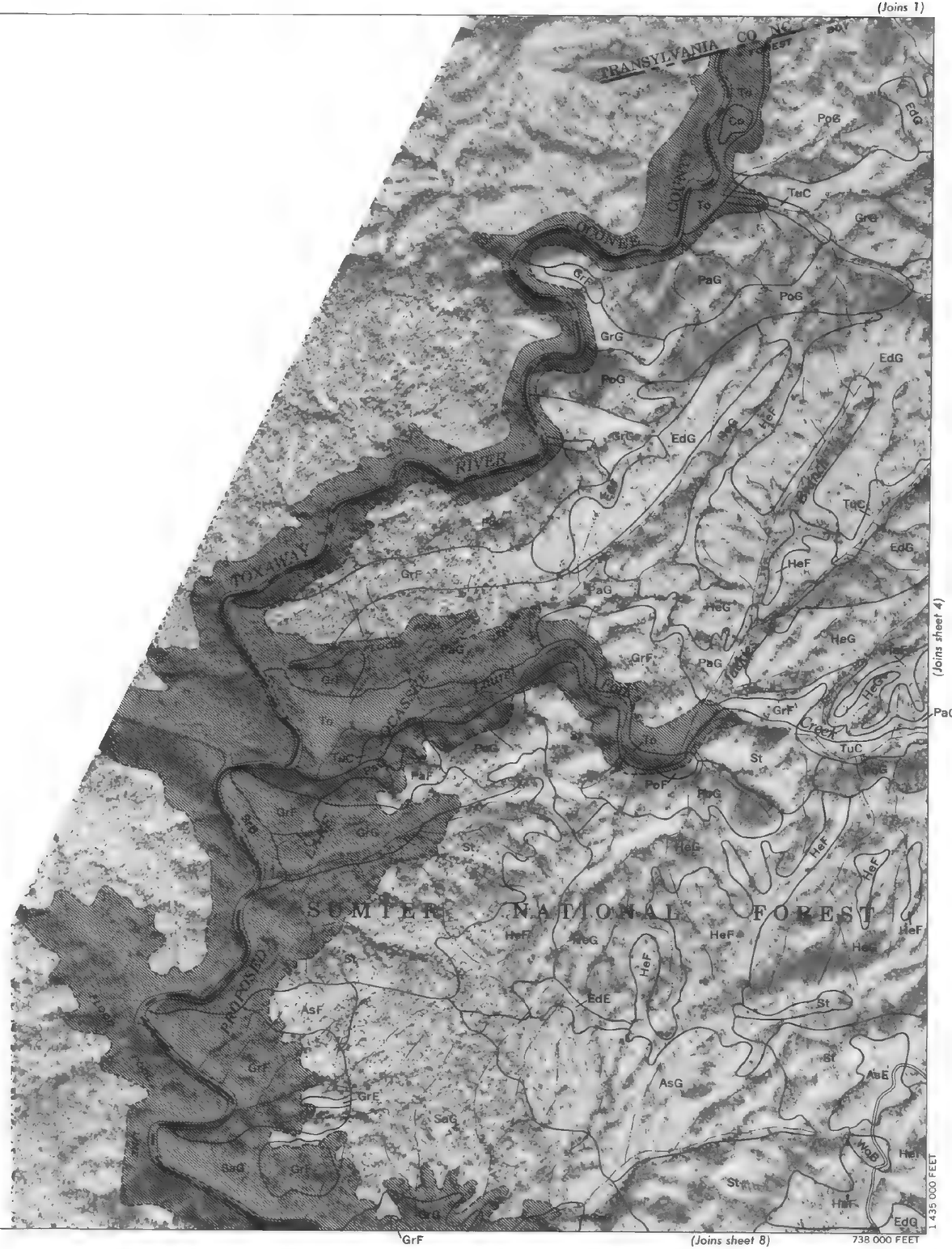
Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

PICKENS COUNTY, SOUTH CAROLINA NO. 3

754 000 FEET

1 410 000 FEET

(Joins 1)



(Joins sheet 4)

(Joins sheet 8)

GrF

1 435 000 FEET

738 000 FEET

3

N

1 Mile

5 000 Feet

0

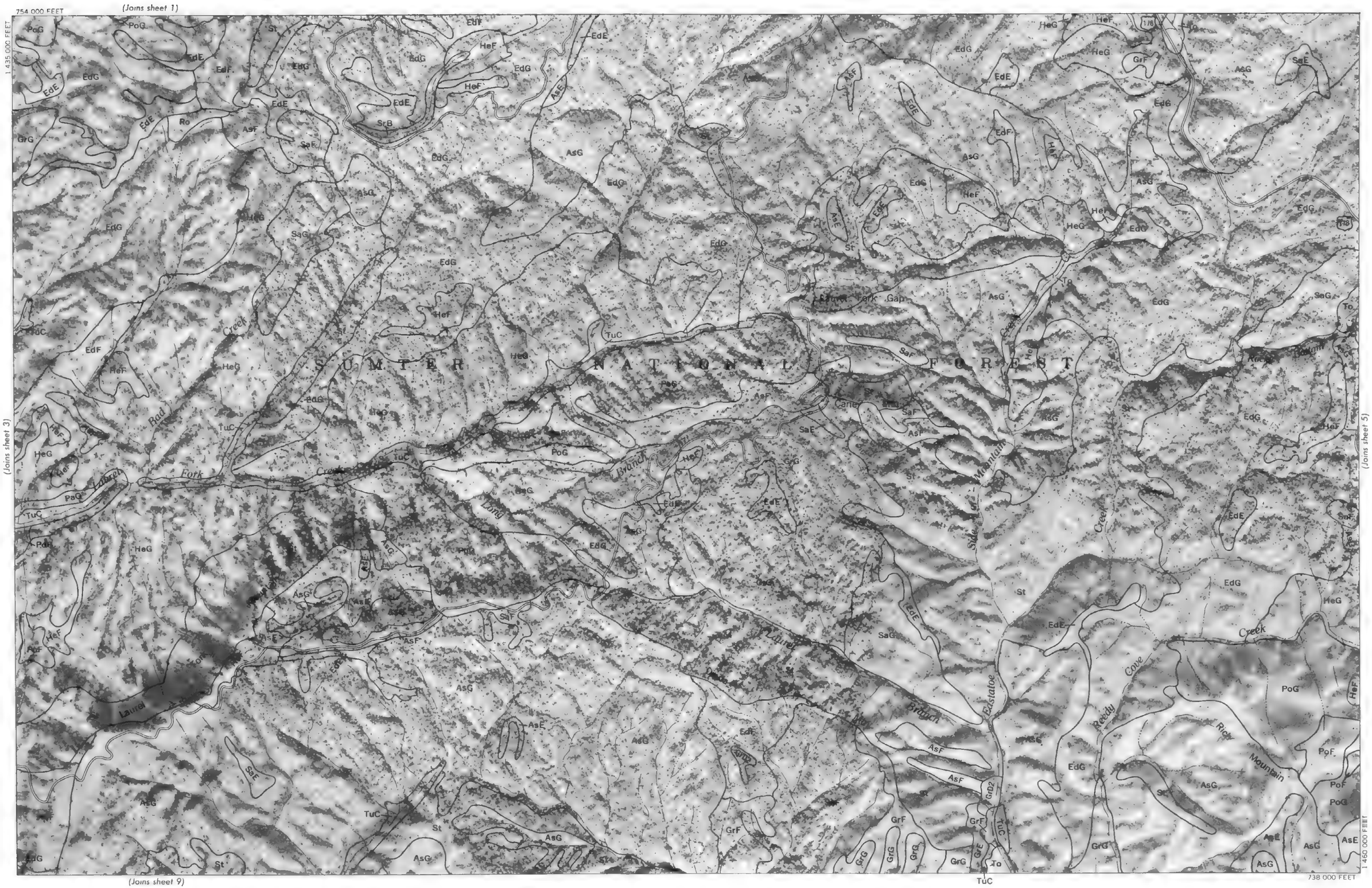
1:20 000

Scale 1:20 000

1/4 0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.



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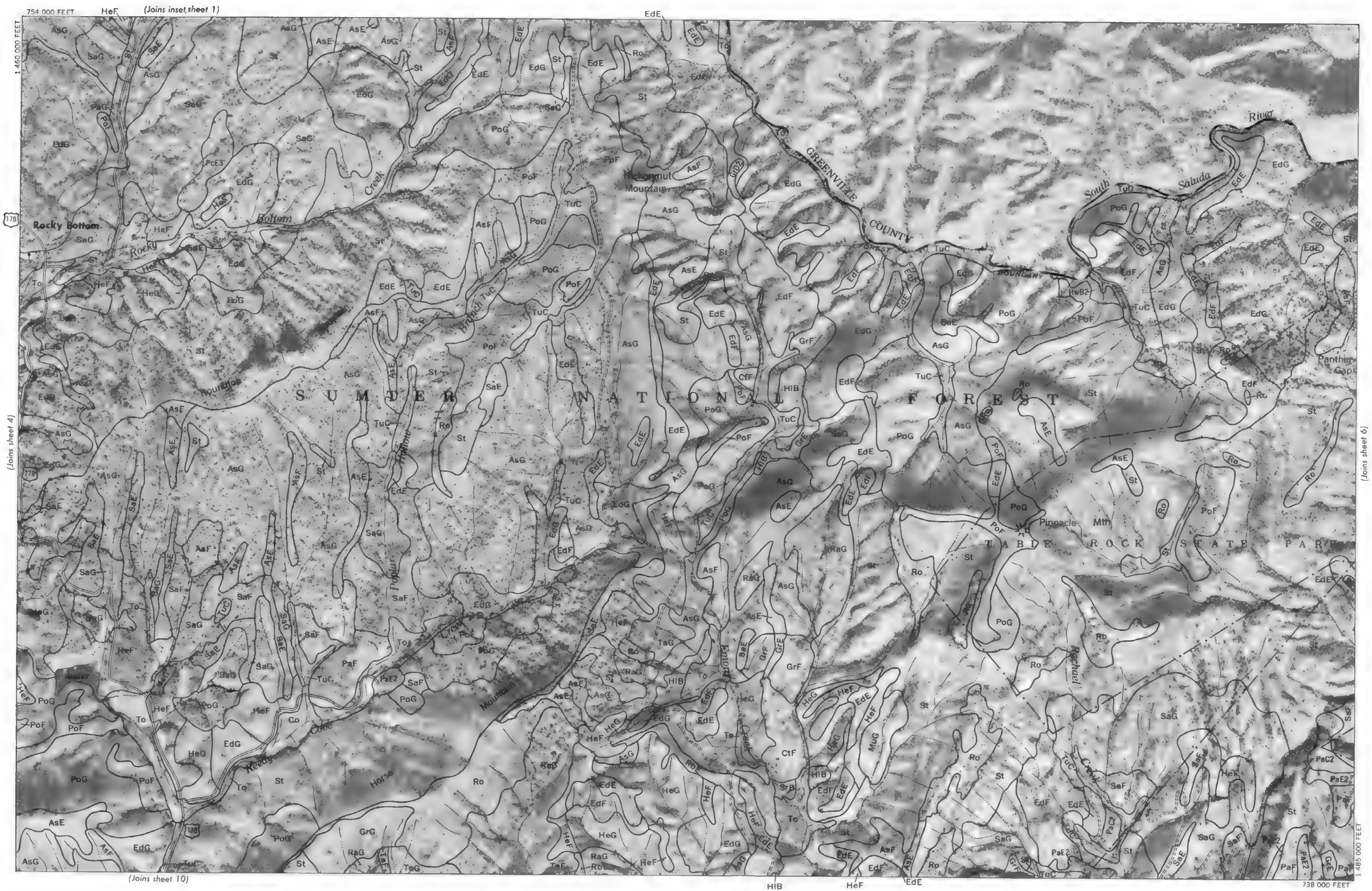

N

1 Mile
5 000 Feet
Scale 1:20 000

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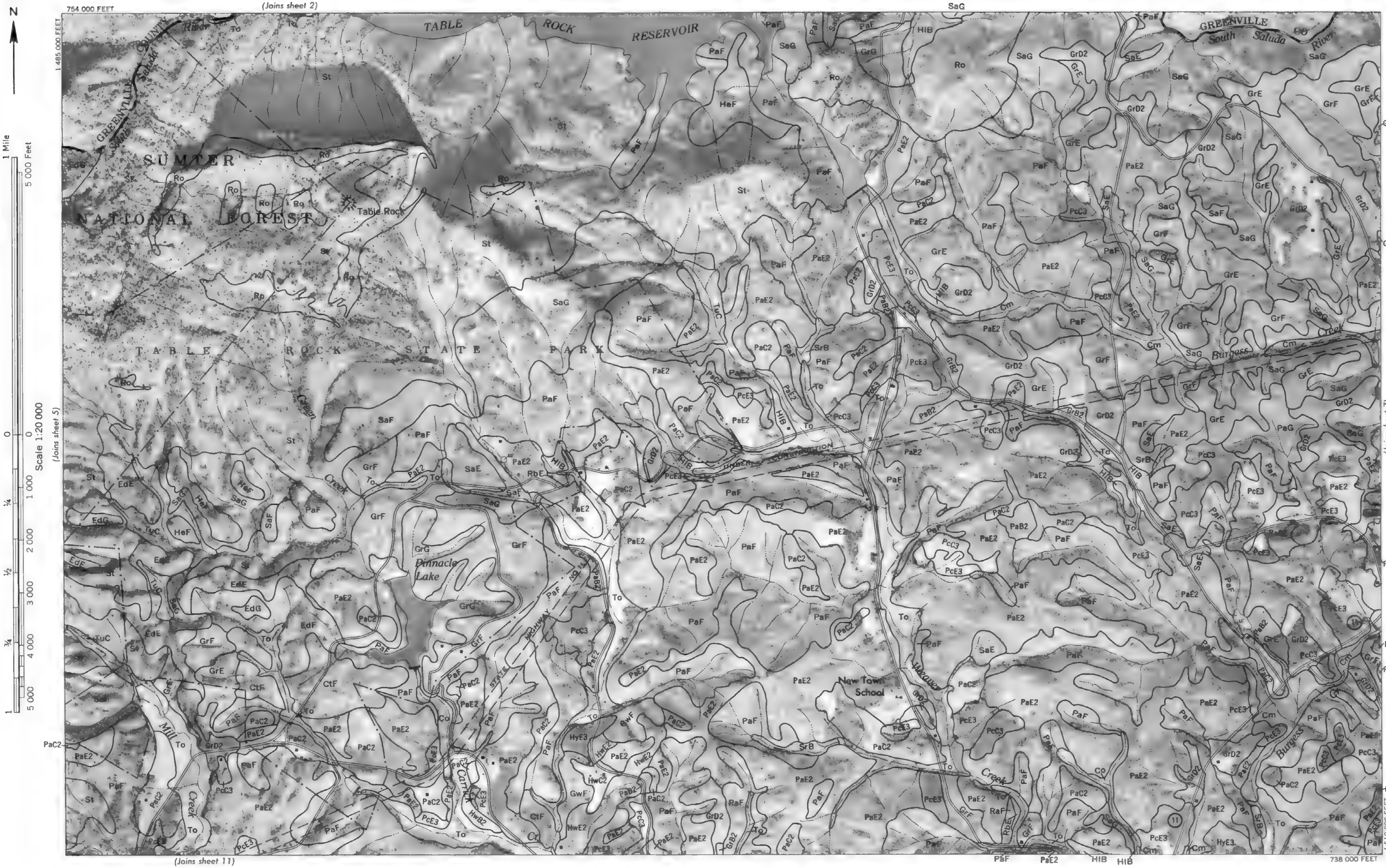

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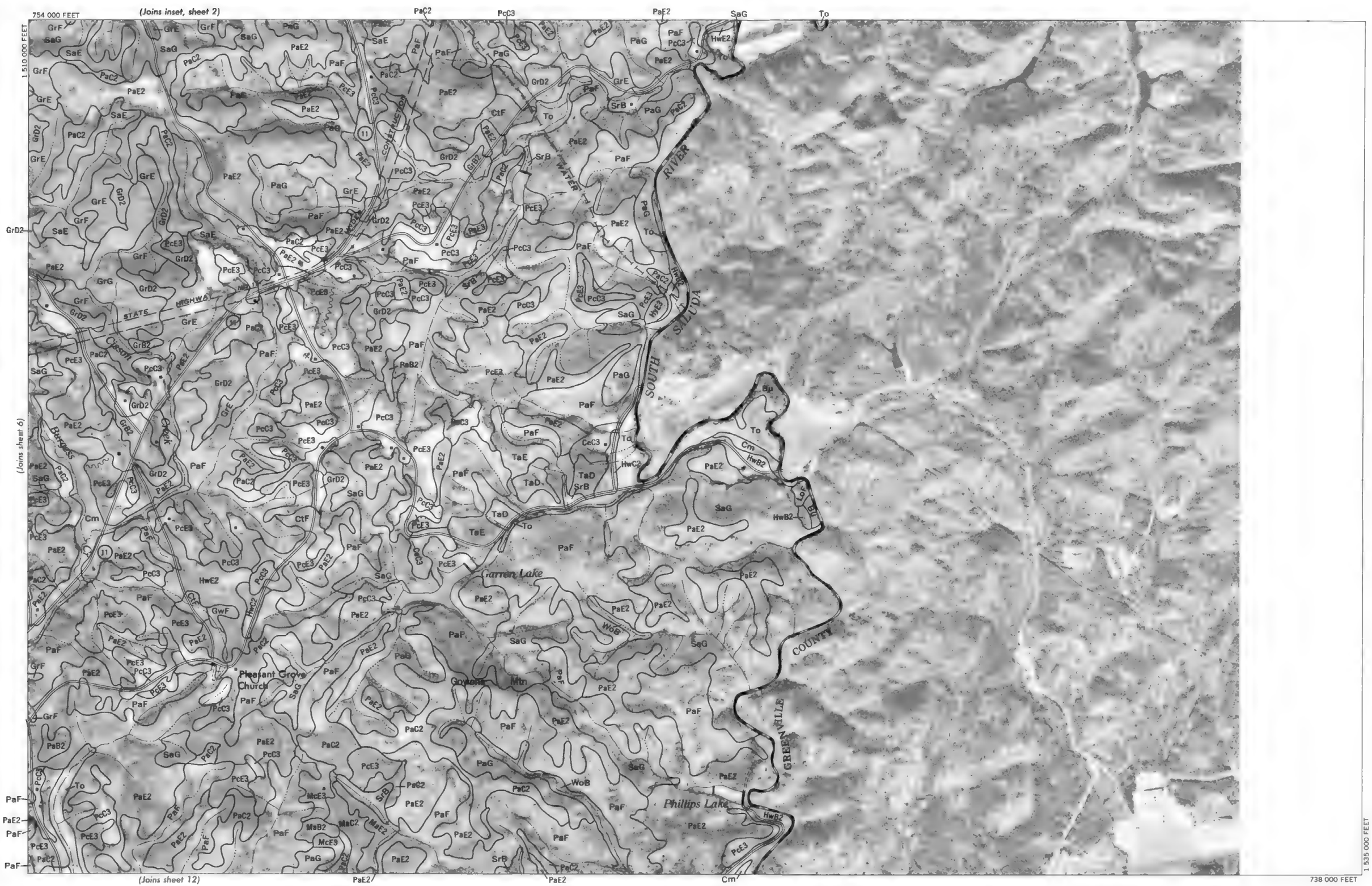


PICKENS COUNTY, SOUTH CAROLINA NO. 7

7

N

1 Mile
5 000 Feet
Scale 1:20 000

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

N

738 000 FEET

1 410 000 FEET

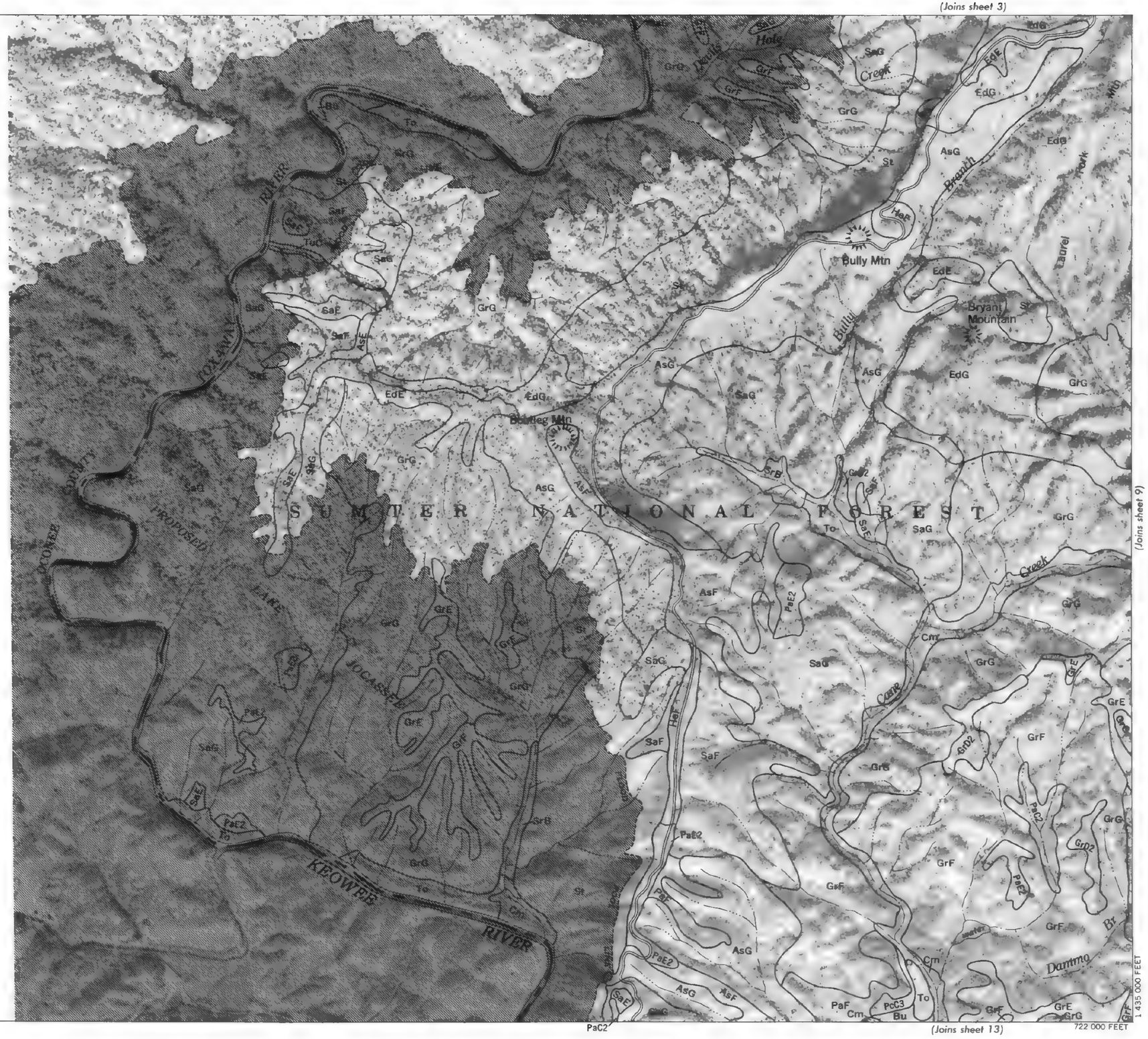
1 Mile

5 000 Feet

Scale 1:20 000

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000



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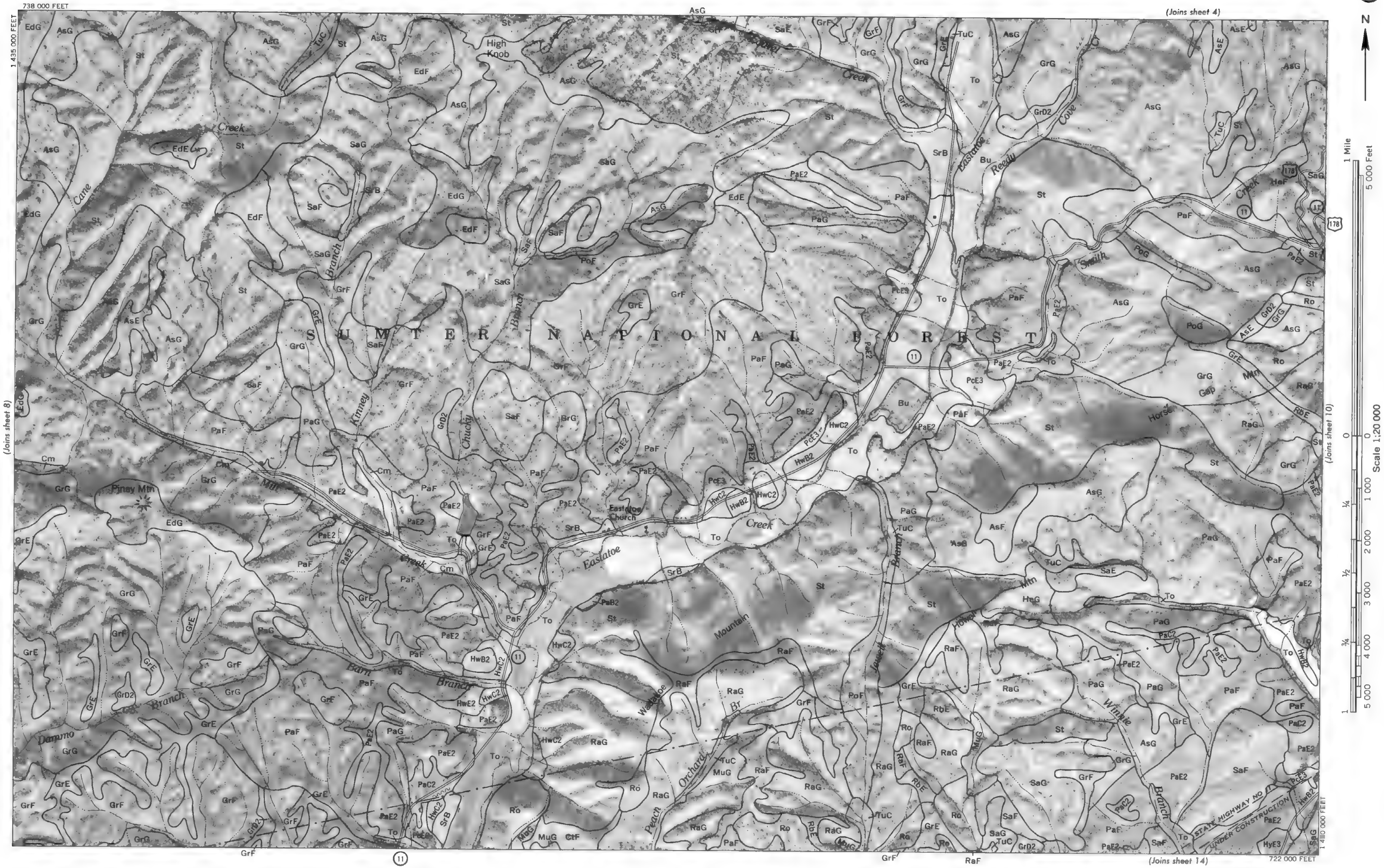
PICKENS COUNTY, SOUTH CAROLINA NO. 8

PICKENS COUNTY, SOUTH CAROLINA NO. 9



Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

(10)

N

738 000 FEET

1 460 000 FEET

AsF (Joins sheet 5)

SUMTER NATIONAL FOREST

Scale 1:20 000

1 Mile

5 000 Feet

0 0

¼ 1 000

½ 2 000

¾ 4 000

1 5 000

(Joins sheet 9)

(Join sheet 15)

EdE

GrE

722 000 FEET

1 485 000 FEET

(Joins sheet 11)

PICKENS COUNTY, SOUTH CAROLINA NO. 10

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

738 000 FEET

1 485 000 FEET

(Joins sheet 6)

(Joins sheet 10)

(Joins sheet 12)

(Joins sheet 16)

722 000 FEET

1 510 000 FEET

11

N

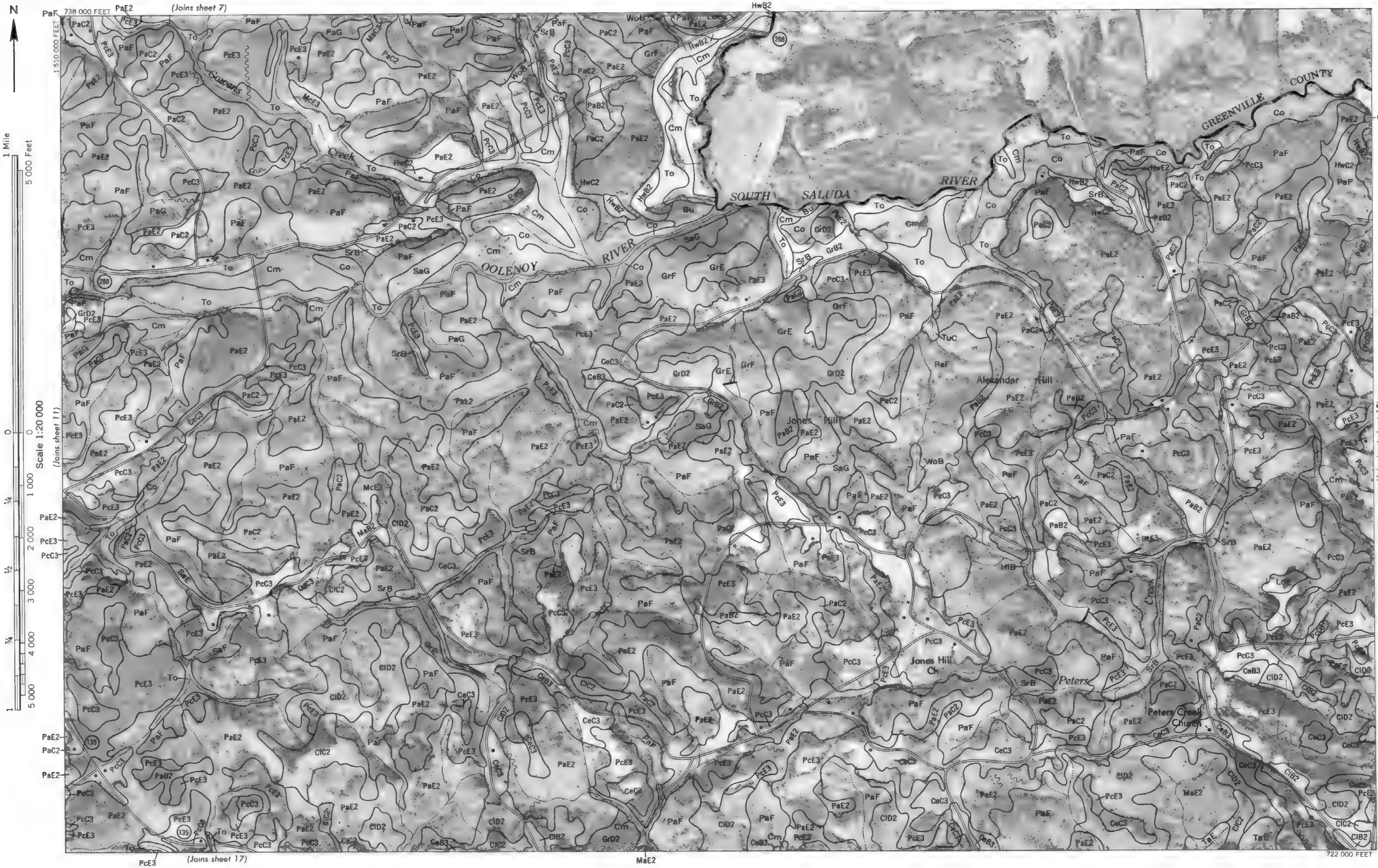
1 Mile

5 000 Feet

Scale 1:20 000

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

PICKENS COUNTY, SOUTH CAROLINA — SHEET NUMBER 12



PICKENS COUNTY, SOUTH CAROLINA NO. 12

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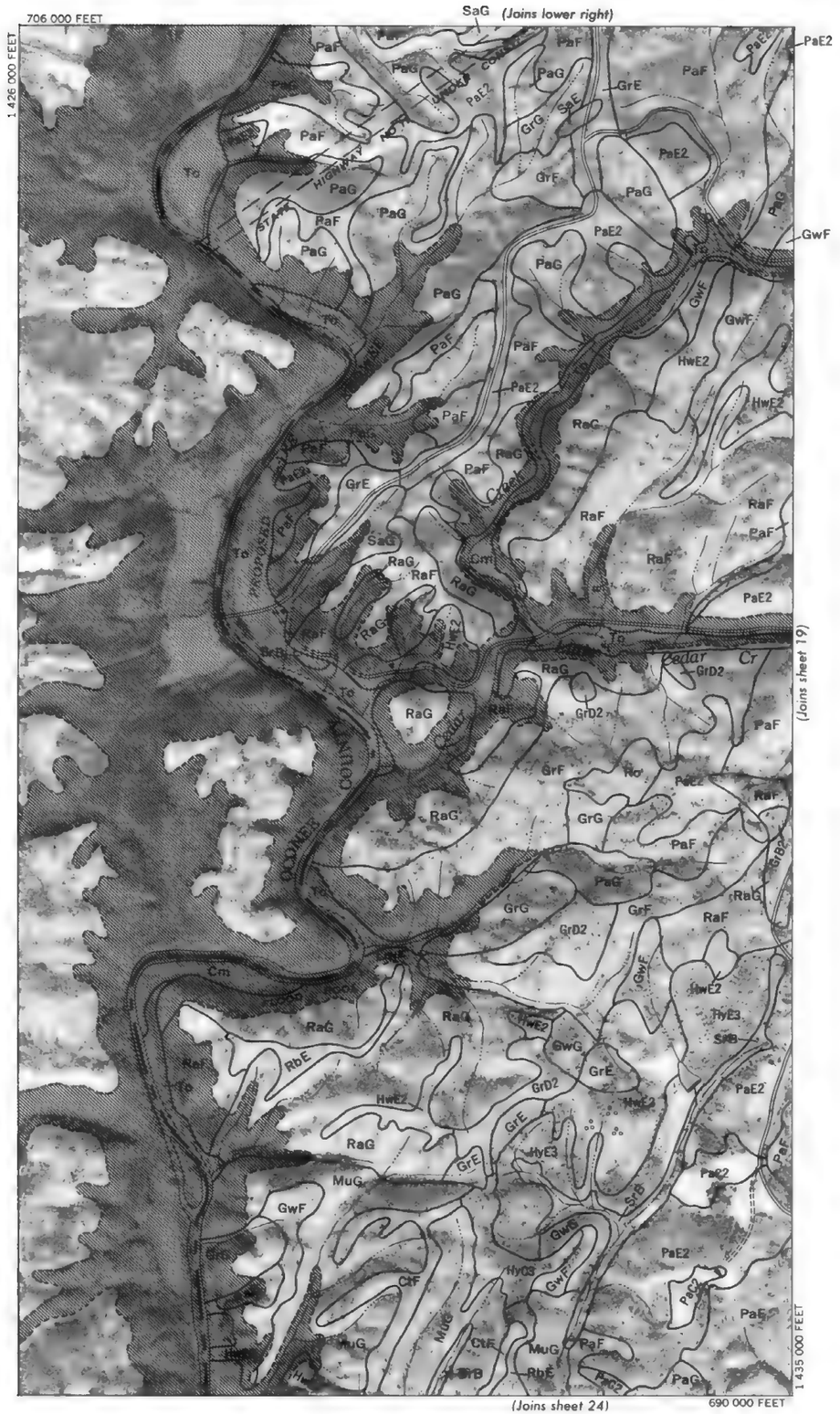
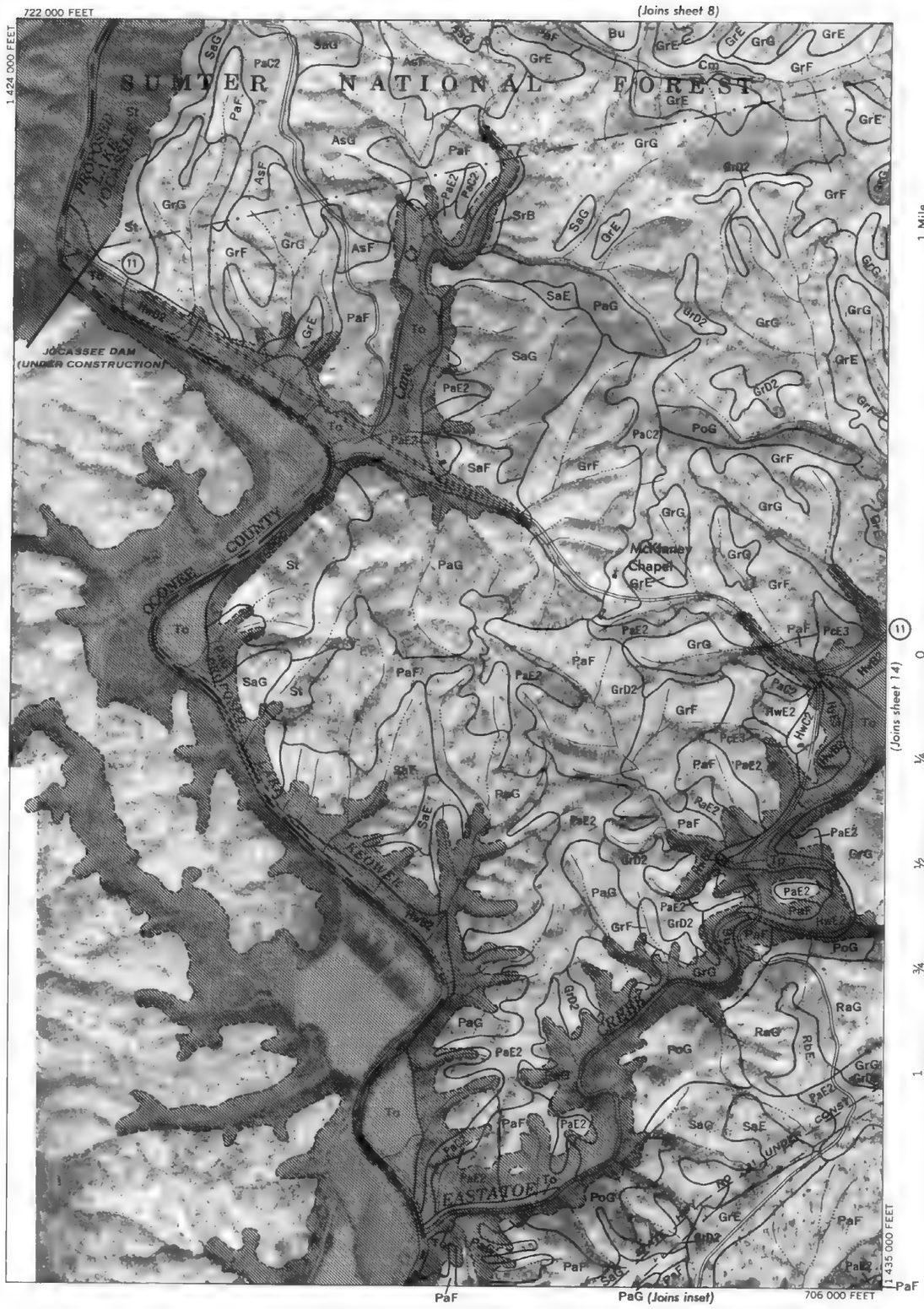




13

N

1 Mile

5 000 Feet

Scale 1:20 000

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

N

722 000 FEET

1 435 000 FEET

(Joins sheet 9)

1 Mile

5 000 Feet

Scale 1:20 000

(Joins sheet 13)

(Joins sheet 15)

PICKENS COUNTY, SOUTH CAROLINA NO. 14

(Join sheet 15)

1 460 000 FEET

706 000 FEET

(Joins sheet 19)

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

722 000 FEET

1 460 000 FEET

(Joins sheet 10)

(Joins sheet 14)

(Joins sheet 16)

(Joins sheet 20)

1 485 000 FEET

706 000 FEET

15

N

1 Mile

5 000 Feet

0 0

Scale 1:20 000

1 5 000 ¾ 4 000 ½ 3 000 ¼ 2 000 0 1 000

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

16

N

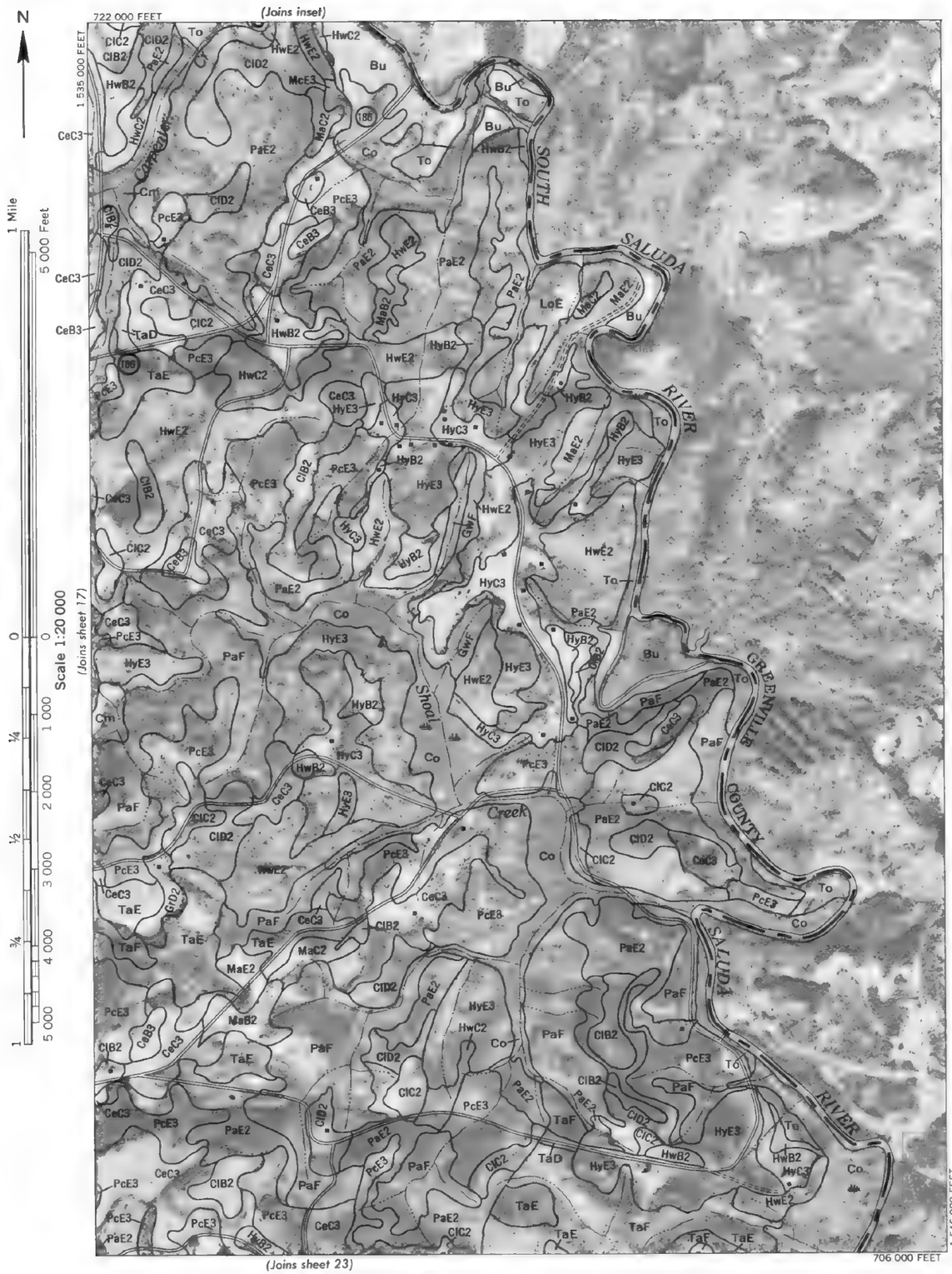
Scale 1:20 000

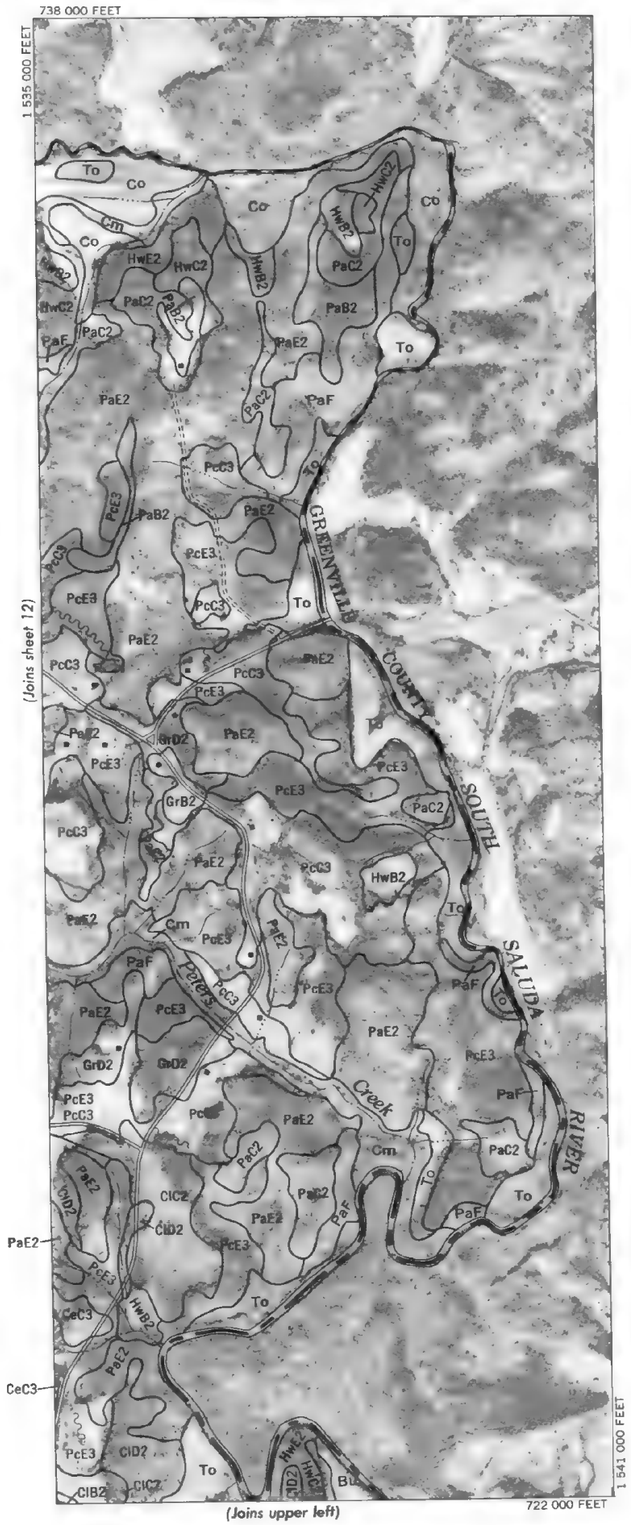
1 Mile ¾ ½ ¼ 0

5 000 Feet 4 000 3 000 2 000 1 000 0

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

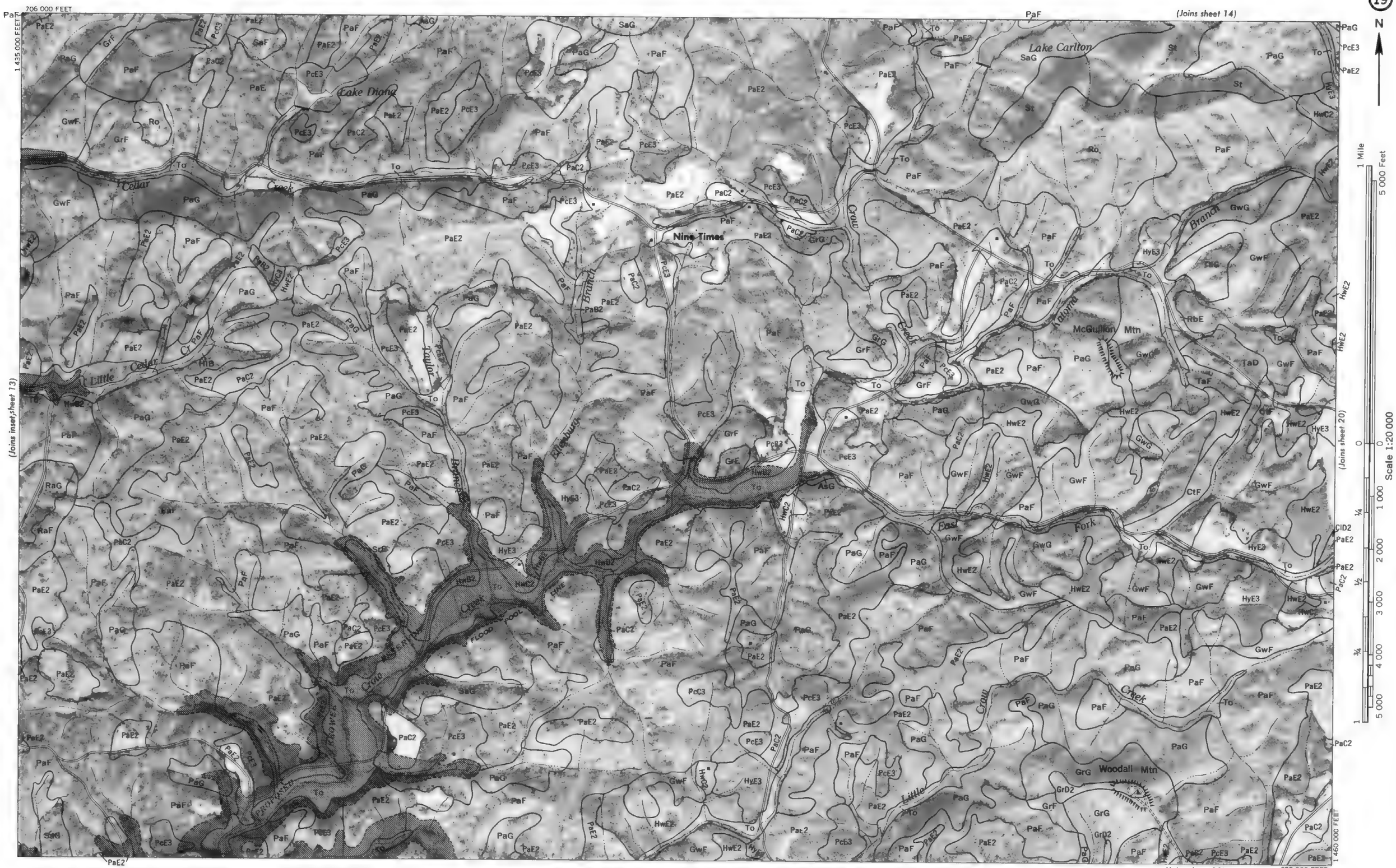
Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.





PICKENS COUNTY, SOUTH CAROLINA NO. 18

Photobase from 1965 aerial photography. Positions of grid lines are approxim
and based on the South Carolina coordinate system, north zone.



Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

20

N

706 000 FEET

1 460 000 FEET

(Joins sheet 15)

1 Mile

5 000 Feet

Scale 1:20 000

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

(Joins sheet 19)

Adams Creek

Mill Shoals Cr

Middle Fork

Twelve Mile Creek

North Fork

Cold Springs Ch

Dogwood Gr

Kirksey Mtn

Martin Grove Church

Lewis School

Gregory Creek

Hayes and Collins Lake

Concord Church

Red Hill Church

Town Cr

PICKENS (county seat)

(Joins sheet 26)

(Joins sheet 21)

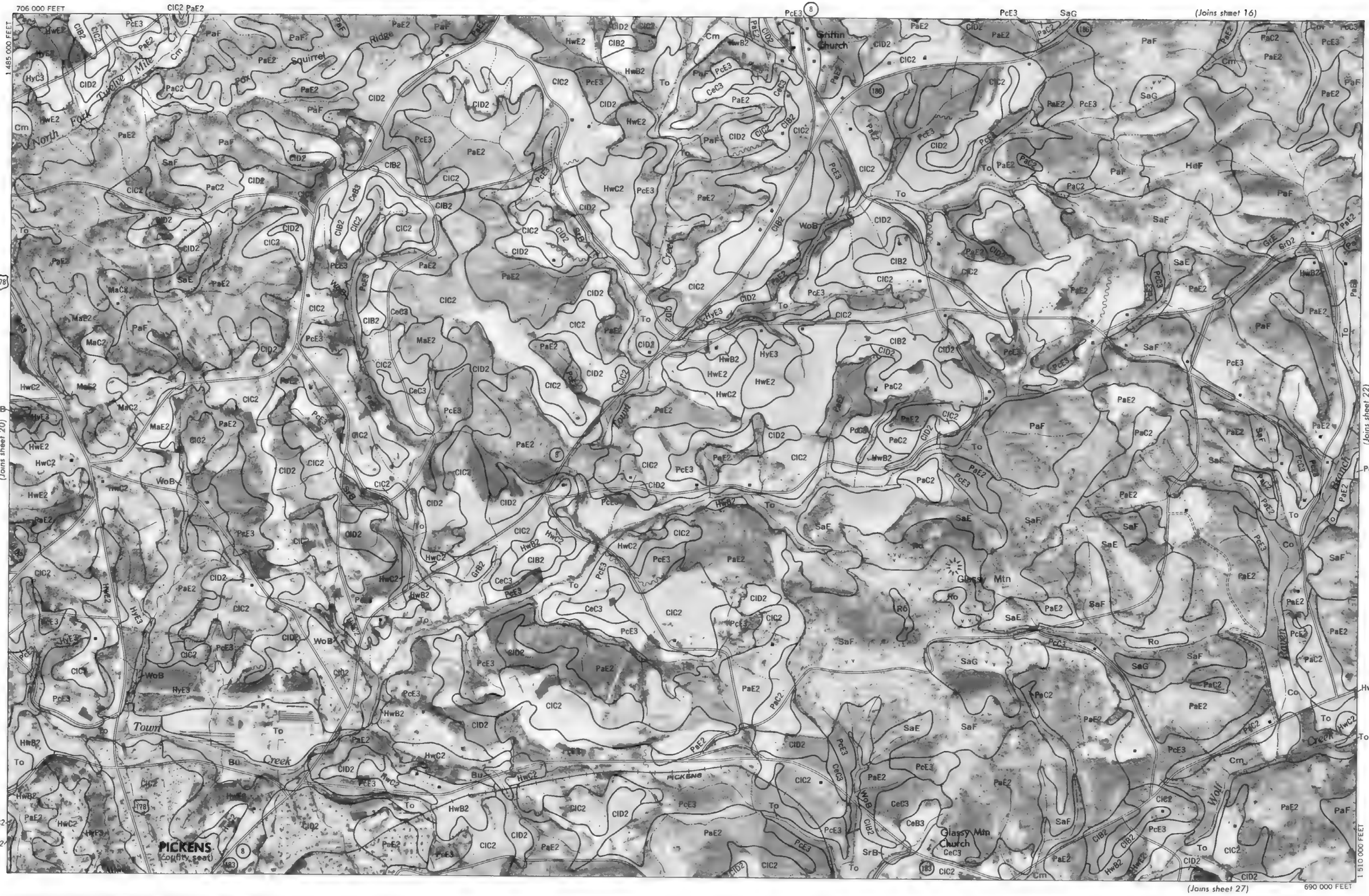
1 485 000 FEET

690 000 FEET

PICKENS COUNTY, SOUTH CAROLINA NO. 20

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

PICKENS COUNTY, SOUTH CAROLINA NO. 21



Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone

22

N

706 000 FEET

1 510 000 FEET

(Joins sheet 17)

Hendricks

Doodles Creek

Blue Ridge Church

Hickory Nut Mtn

Cross Roads Church

Wolf Creek

Cedar Rock Mtn

Machine Creek

(Joins sheet 21)

(Joins sheet 23)

(Joins sheet 28)

1 Mile

5 000 Feet

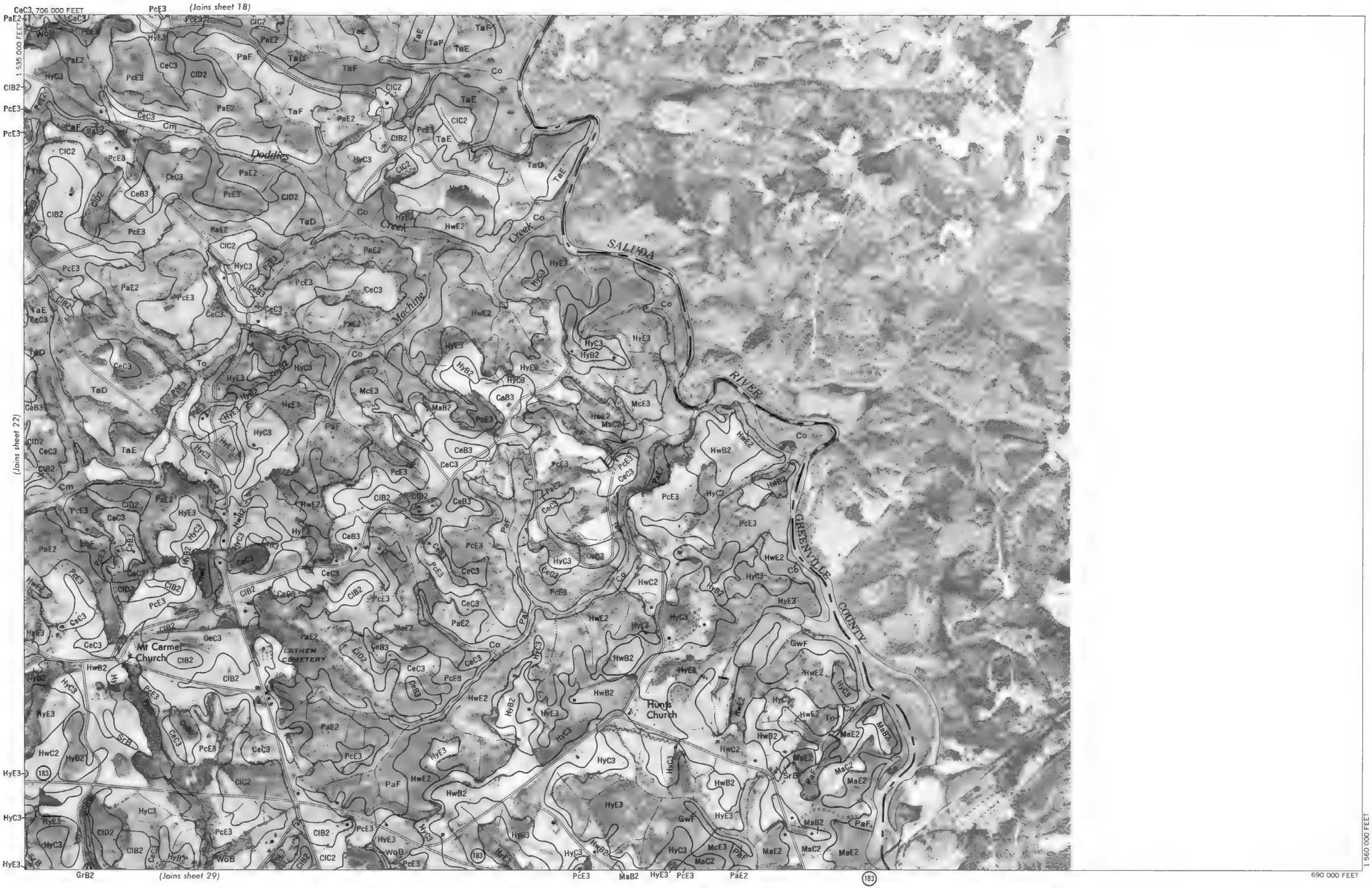
Scale 1:20 000

1 535 000 FEET

690 000 FEET

PICKENS COUNTY, SOUTH CAROLINA NO. 22

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.



Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

24

N

1 Mile

5 000 Feet

Scale 1:20 000

674 000 FEET

(Joins lower right)

1 428 000 FEET

1 435 000 FEET

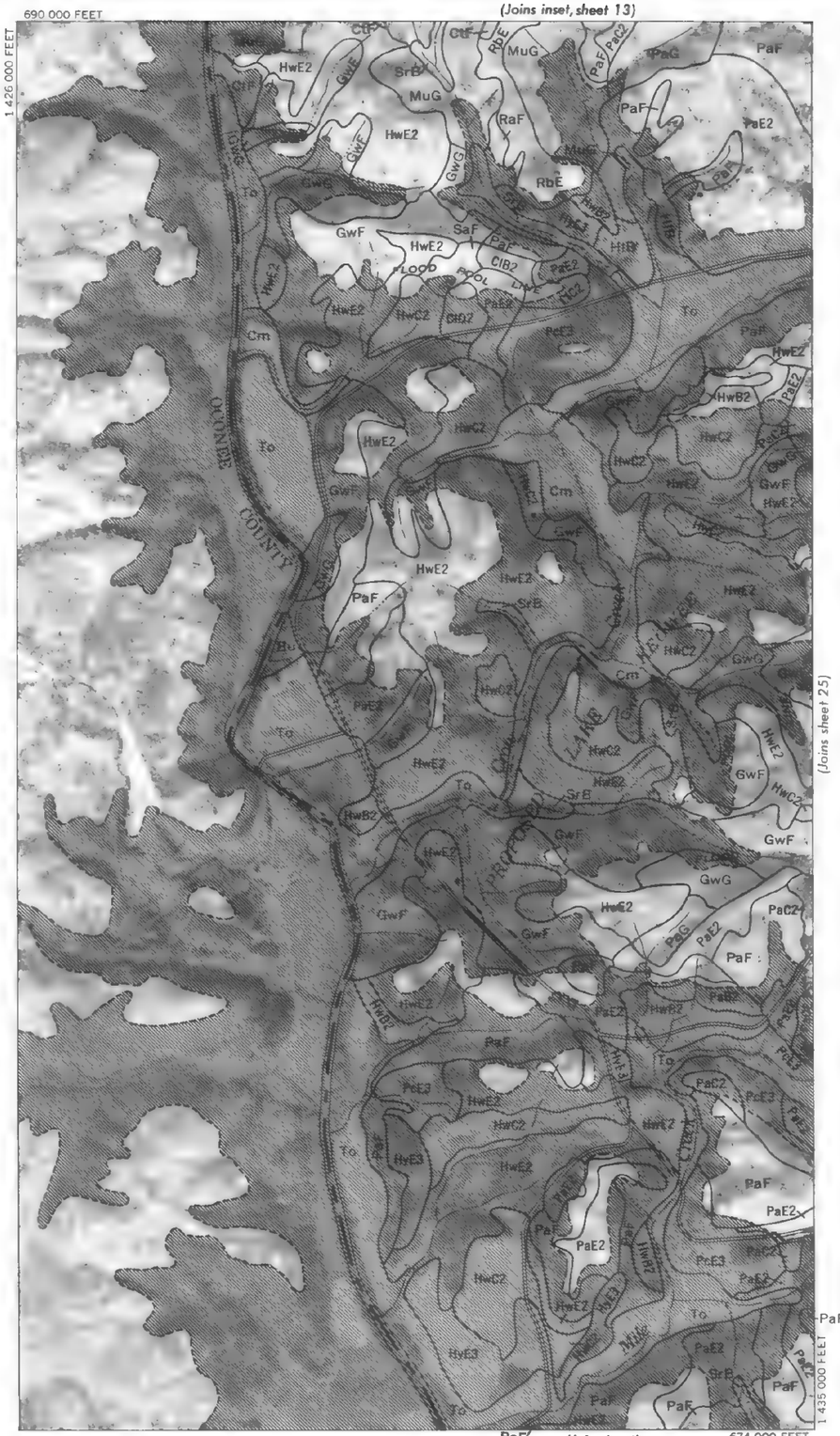
658 000 FEET

(Joins 35)

690 000 FEET

(Joins inset, sheet 13)

1 426 000 FEET



1 435 000 FEET

PaF

(Joins inset)

674 000 FEET

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

PICKENS COUNTY, SOUTH CAROLINA NO. 24

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

N

690 000 FEET

1 460 000 FEET

(Joins sheet 20)

PICKENS
(county seat)

Scale 1:20 000
1 Mile
5 000 Feet

(Joins sheet 25)

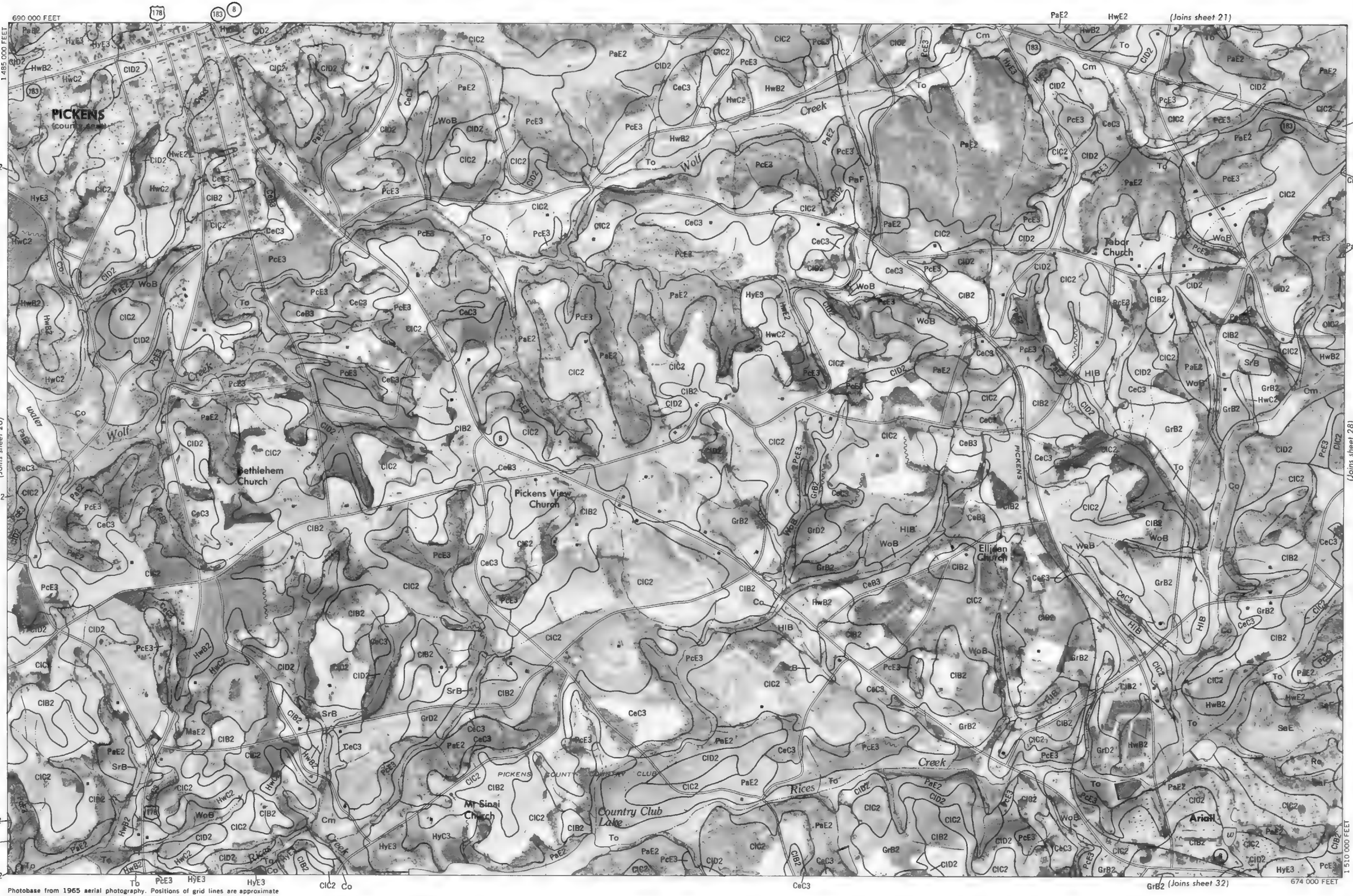
(Joins sheet 27)

(Joins sheet 31)

674 000 FEET

1 485 000 FEET

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.



PICKENS COUNTY, SOUTH CAROLINA NO. 27

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

28

N

690 000 FEET

1 510 000 FEET

(Joins sheet 22)

Cedar Rock Mtn

Cedar Rock Church

New Foundation Church

Mad Creek

Georges Creek

Turpentine

(Joins sheet 27)

(Joins sheet 29)

CID2 (Joins sheet 33)

674 000 FEET

1 535 000 FEET

1 Mile

5 000 Feet

Scale 1:20 000

0 0

1/4 1 000

1/2 2 000

3/4 3 000

1 4 000

5 000

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

PICKENS COUNTY, SOUTH CAROLINA NO. 28

690 000 FEET

1 535 000 FEET

(Joins sheet 23)

(Joins sheet 28)

(Joins sheet 34)

674 000 FEET

1 560 000 FEET

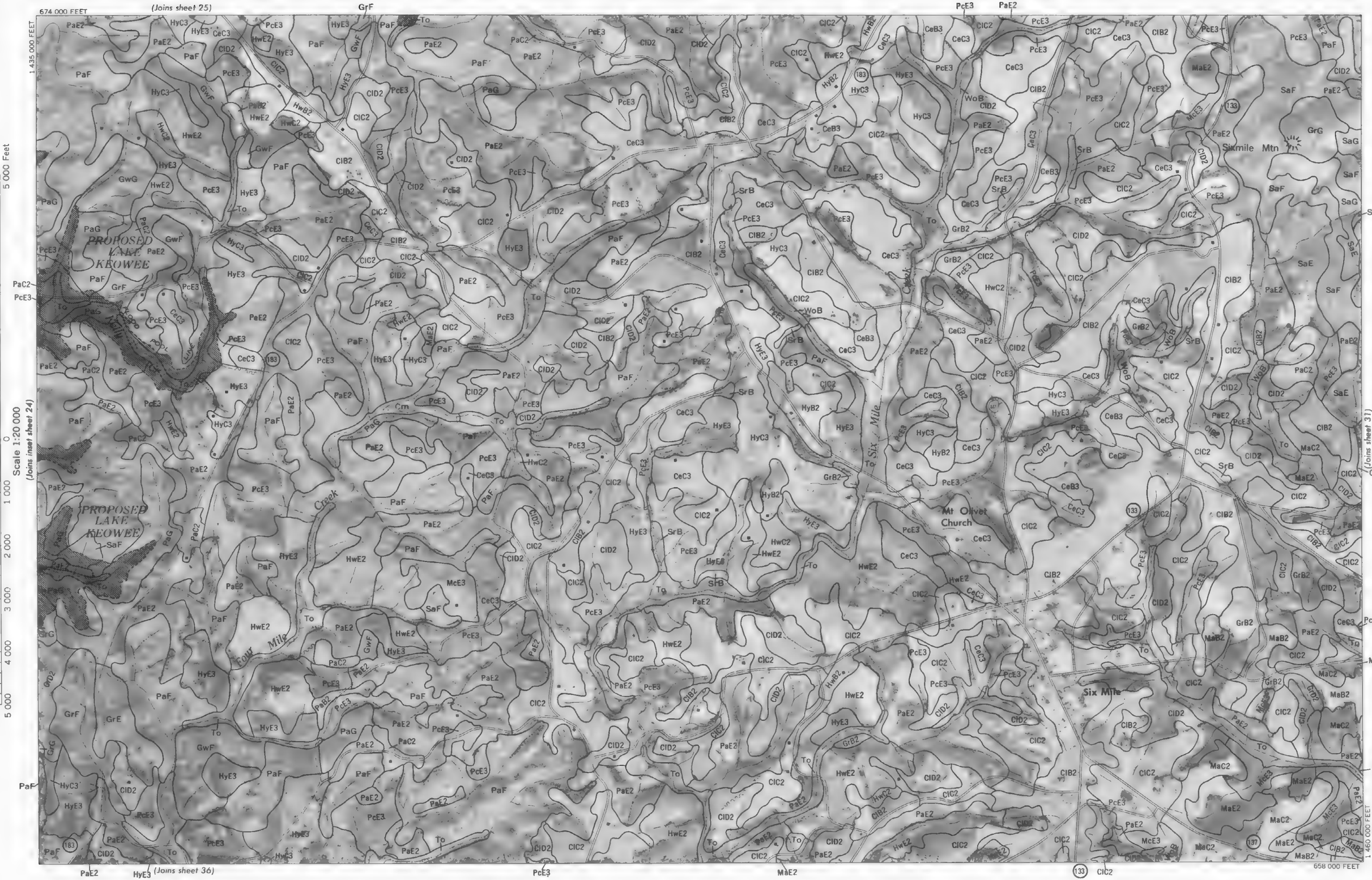
N

1 Mile

5 000 Feet

Scale 1:20 000

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.



PICKENS COUNTY, SOUTH CAROLINA NO. 30

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

N

674 000 FEET

1 460 000 FEET

(Joins sheet 26)

(Joins sheet 30)

(Joins sheet 32)

(Joins sheet 37)

1 485 000 FEET

658 000 FEET

Praters Creek Church

Roanoke School

Fairview Church

Twelve Mile Creek

Rices Creek

Golden Creek

Shoal Creek

Cm

Bu

Scale 1:20 000

1 Mile

5 000 Feet

1 0 1 2 3 4 5 000

¼ ½ ¾

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

32

N

1 485 000 FEET

PaE2 674 000 FEET

(Joins sheet 27)

Country Club Lake

Enon Church

Creek

Golden

Rices Cr Ch

QUARRY

SOUTHERN

1 Mile

5 000 Feet

Scale 1:20 000

0 0

1/4 1 000

1/2 2 000

3/4 4 000

1 5 000

(Joins sheet 31)

(Joins sheet 33)

(Joins sheet 38)

1 510 000 FEET

658 000 FEET

PICKENS COUNTY, SOUTH CAROLINA NO. 32

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

674 000 FEET

1 510 000 FEET

(Joins sheet 28)

(Joins sheet 32)

(Joins sheet 34)

(Joins sheet 39)

658 000 FEET

1 535 000 FEET

N

1 Mile

5 000 Feet

Scale 1:20 000

EASLEY

Alice Mill School

Clear View School

East End School

Easley High Sch

Pickensville

Dayton School

Rock Spring Ch

Hamilton Lor

Middle Branch

Eighteen Mile Creek

Brushy Creek

Creek

water

SOUTHERN

PICKENS

GWF

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

658 000 FEET

1 410 000 FEET

642 000 FEET

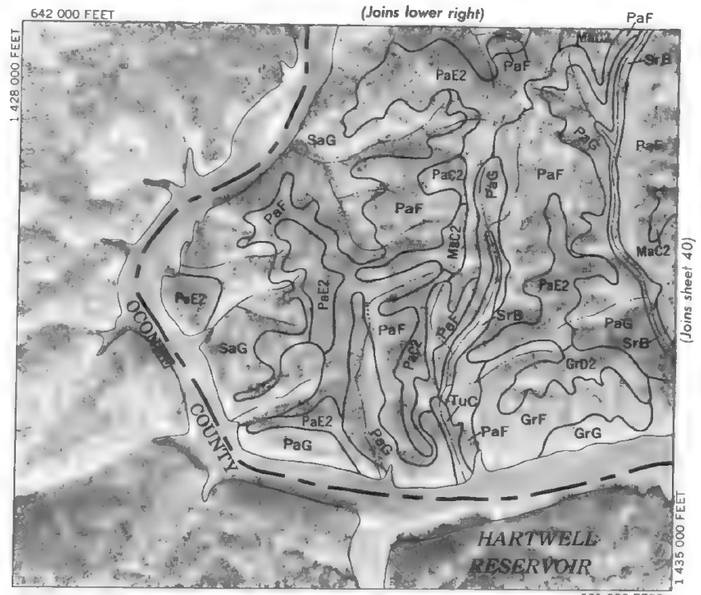
(Joins lower right)

1 428 000 FEET

(Joins sheet 40)

1 435 000 FEET

636 000 FEET



(Joins inset 24)

(Joins sheet 36)

1 435 000 FEET

(Joins inset)

642 000 FEET

35

N

1 Mile

5 000 Feet

Scale 1:20 000

1 ¼ 0 1 000 2 000 3 000 4 000 5 000

PICKENS COUNTY, SOUTH CAROLINA NO. 35

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

PICKENS COUNTY, SOUTH CAROLINA NO. 36

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

38

N

658 000 FEET

1 485 000 FEET

(Joins sheet 32)

LIBERTY

Rylaumah Church

Five Forks

Golden Grove Church

Flat Rock School

Carmel Church

Eighteen Mile Creek

Carmel Creek

SOUTHERN

1 Mile

5 000 Feet

Scale 1:20 000

1 000 0 1 000 2 000

¼ ½

2 000 3 000

¾ 4 000

1 5 000

(Joins sheet 37)

(Joins sheet 39)

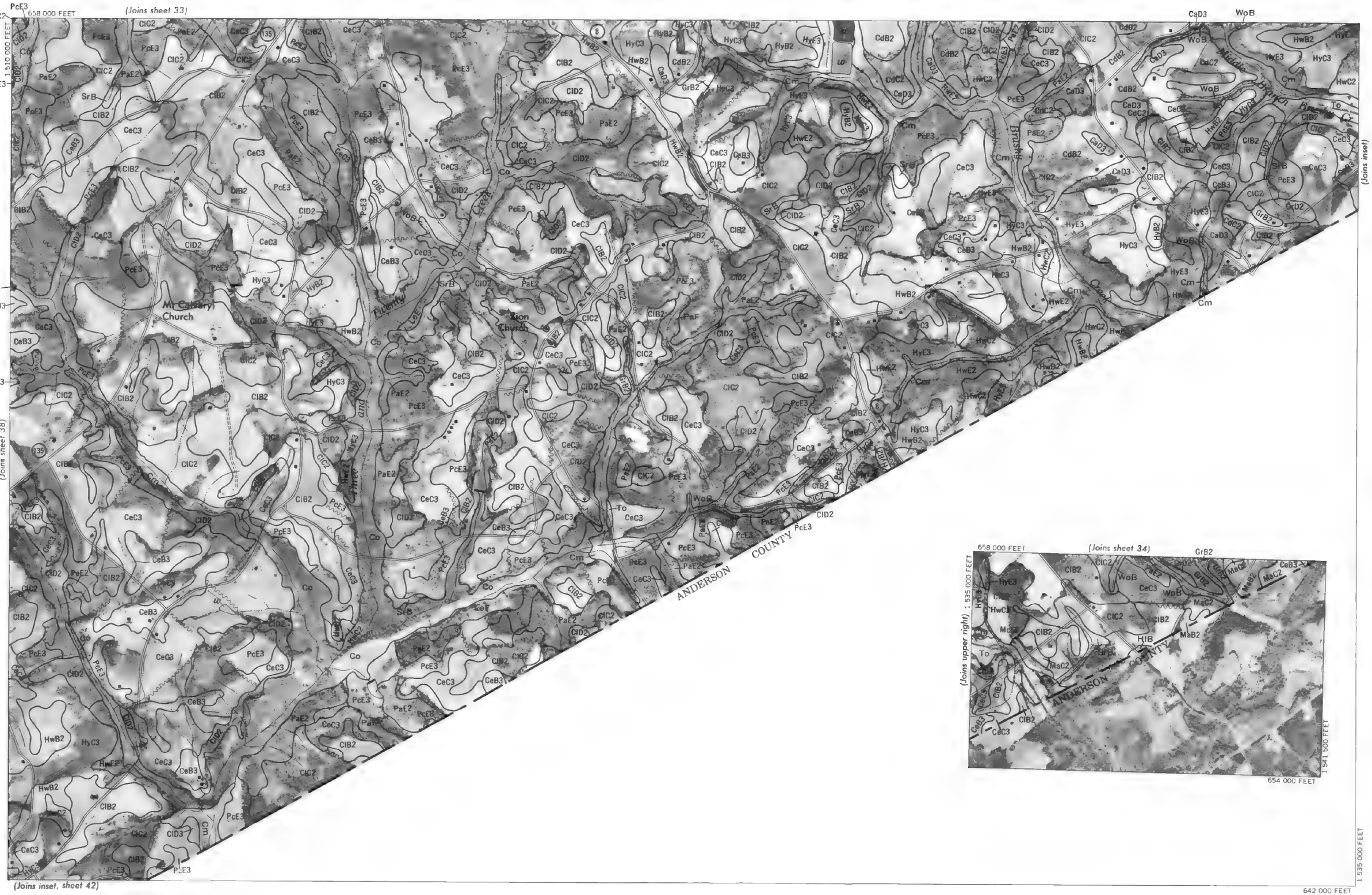
(Joins sheet 42)

1 510 000 FEET

642 000 FEET

PICKENS COUNTY, SOUTH CAROLINA NO. 38

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.



N

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

40

N

642 000 FEET

1 435 000 FEET

(Joins inset, sheet 35)

(Joins sheet 36)

1 Mile

5 000 Feet

0 0

Scale 1:20 000

¼ 1 000

½ 2 000

¾ 3 000

1 4 000

5 000

Issaquena Lake

Lawrence Chapel

CREEK

MILE

TWELVE

OCONEE COUNTY RESERVOIR

HARTWELL RESERVOIR

water

(133)

(Joins sheet 41)

PICKENS COUNTY, SOUTH CAROLINA NO. 40

1 460 000 FEET

626 000 FEET

(Joins sheet 43)

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

642 000 FEET

1 460 000 FEET

(Joins sheet 40)

(Joins sheet 37)

(Joins sheet 42)

(Joins sheet 44)

1 485 000 FEET

626 000 FEET

N

1 Mile

5 000 Feet

Scale 1:20 000

0 1 000 2 000 3 000 4 000 5 000

0 ¼ ½ ¾ 1

MILE CREEK

TWELVE

SOUTHERN

New Olive Grove Ch

Wesleyan College

CENTRAL

MT. ZION CEMETERY

Fifteen Mile Creek

EIGHTEEN MILE CREEK

White Oak Church

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

N

642 000 FEET

1 485 000 FEET

(Joins sheet 38)

(Joins inset)

Flat Rock Church

Eighteen Mile Creek

ANDERSON COUNTY

1 Mile

5 000 Feet

Scale 1:20 000

(Joins sheet 41)

626 000 FEET

1 510 000 FEET

PICKENS COUNTY, SOUTH CAROLINA NO. 42

(Joins upper right)

642 000 FEET

(Joins 39)

1 510 000 FEET

ANDERSON COUNTY

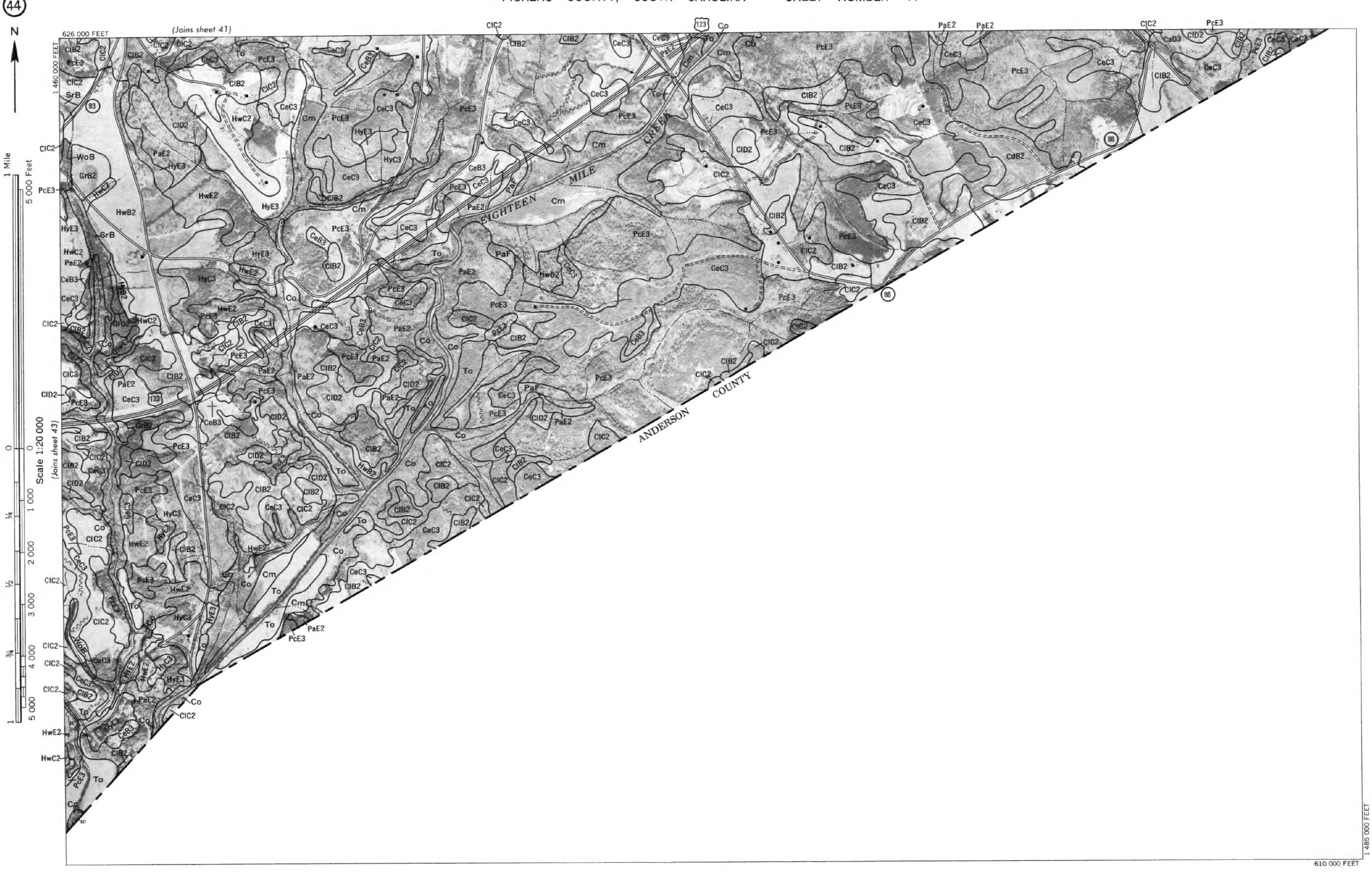
1 513 000 FEET

640 000 FEET

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

PICKENS COUNTY, SOUTH CAROLINA NO. 43

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.



PICKENS COUNTY, SOUTH CAROLINA NO. 44

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.

610 000 FEET

1 435 000 FEET

45

N

(Joins sheet 43)

New Hope Church

Cherrys Crossing

SOUTHERN

RESERVOIR

RIVER

HARTWELL

SENECA

OCONEE COUNTY

ANDERSON COUNTY

(Joins inset)

1 Mile

5 000 Feet

Scale 1:20 000

1 460 000 FEET

594 000 FEET

594 000 FEET

(Joins lower left)

1 433 000 FEET

1 441 000 FEET

590 000 FEET

SENECA

HARTWELL RES

OCONEE RIVER

ANDERSON COUNTY

Photobase from 1965 aerial photography. Positions of grid lines are approximate and based on the South Carolina coordinate system, north zone.